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THE SOUTHWESTERN CO-TRADITION[1]

PAUL S. MARTIN AND JOHN B. RINALDO

THE CONCEPT of the co-tradition as a classification scheme for characterizing an area of native culture is not entirely new, although the term is new. Bennett has recently revived and stream-lined this idea and has successfully applied it to the study of the Andean High Cultures.[2] He suggested that the areal co-tradition concept might be a useful tool for the culture historians of other areas. In a recent publication, in which the Peruvian co-tradition was given in some detail, he also suggested some Southwestern culture traits that might form part of a Southwestern co-tradition.[3]

Kroeber, Kidder, and others have sensed, for some time, that the Southwestern climax is a natural culture area.[4] The Southwest is a generally arid and elevated area, and is considered a geographical, ecological, climatological unit. There are some major environmental contrasts, but on the whole the area is uniform. But, there is another side to the story. We have in this area a region occupied mostly by aboriginal farmers; three parallel and allied developments, each having its own "flavor"; and a level of culture that was reached in the course of a rather remarkable and uniform development throughout the entire region.

1 Paper presented at the annual meeting of the American Anthropological Association held at the University of California, Berkeley, California, in December 1950. Documentation and research assistance were provided by Herbert C. Taylor, Jr., Teaching Assistant, Department of Anthropology, University of Chicago.

2 W. C. Bennett (ed.), *A Reappraisal of Peruvian Archaeology* (Memoirs, Society for American Archaeology, no. 4, 1948), pp. 1-7.

3 *Idem*, p. 6.

4 A. L. Kroeber, *Cultural and Natural Areas in Native North America* (University of California Publications in American Archaeology and Ethnology, vol. 38, 1939), pp. 32-33.

True, there are sub-areas and differences, but a culmination and development in the Southwest was reached at about the same time in the three sub-cultures—the Hohokam, the Mogollon, and the Anasazi.[5] Thus, the Southwestern area of native culture seems well-adapted to the concept of a co-tradition.

Perhaps at this point it would be well to review briefly the definition of the co-tradition.

According to Bennett, an area co-tradition is the over-all unit of cultural history of an area within which the component cultures have been interrelated over a period of time. The co-tradition implies a cultural continuum in an area. The principal elements or characteristics should be found in each sub-division and in each main time period; and each culture included in the area co-tradition should be treated as a whole. The phrase "area co-tradition" refers, then, to the linkage or interrelationships of cultural traditions in time and space.[6]

The area co-tradition should include four major items:

I. First, the area should have over-all characteristics which would distinguish it from other areas. The over-all characteristics that distinguish the Southwestern co-tradition as a whole are:[7]

1. A pre-agricultural and pre-ceramic stage with subsistence provided by food-gathering and/or hunting.

2. A later stage in which subsistence was based largely on maize-beans-squash agriculture.

3. Cultivation of cotton.

4. A village pattern that represents settled communities living in permanent houses.

5. The people lived in pit-houses; or in houses of rough architecture of stone,

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5 Not all students of the area are willing to admit the existence of the cultural entity called Mogollon (cf. J. O. Brew, *Archaeology of Alkali Ridge, Southeastern Utah*, Papers, Peabody Museum of American Archaeology and Ethnology, vol. 21, 1946). The Mogollon culture was first identified by the Gladwins (Winifred and Harold S. Gladwin, *The Eastern Range of the Red-on-Buff Culture*, Medallion Papers, Gila Pueblo, no. 16, 1935, pp. 221-233) and delineated by Haury (Emil W. Haury, *The Mogollon Culture of Southwestern New Mexico*, Medallion Papers, Gila Pueblo, no. 20, 1936). For a summary of the development of the Mogollon concept see Paul S. Martin and John B. Rinaldo, *The SU Site: Excavations at a Mogollon Village, Western New Mexico* (Anthropological Series, Field Museum of Natural History, vol. 32, no. 1, 1940), pp. 9-12, and Paul S. Martin, John B. Rinaldo, and Ernst Antevs, *Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico* (Fieldiana: Anthropology, Chicago Natural History Museum, vol. 38, no. 1, 1949), pp. 17-20.

6 Bennett, *A Reappraisal of Peruvian Archaeology*, pp. 1-2.

7 Traits common to the Southwestern co-tradition area as well as traits diagnostic of the three cultural components are discussed at greater length in Paul S. Martin, George I. Quimby, and Donald Collier, *Indians Before Columbus* (Chicago, 1947), pp. 97-217.

mud, and beams; and/or in storied surface multi-roomed houses of masonry or adobe.

6. A metate and mano were used for grinding; the metate lacked legs; and there was common development from a basin type milling stone, on which a small mano was used with a rotary motion, to a trough and/or flat type of metate, on which a large rectangular mano was utilized in a back-and-forth motion.

7. Subterranean cists or storage pits were used for storage and cooking. (Cooking pits were less common among the Anasazi.)

8. Basketry, weaving, and pottery were highly developed. (Painted pottery was more frequent than in the eastern United States where textured ceramics predominated.)

9. Elaborate symbolic rituals were important, and by that we mean kivas or ball courts, rain and fertility cults, color symbolism, and a group of priests.

10. Atlatl was followed by bow and arrow.

11. Dogs and turkeys were domesticated.

12. There is absence of monumental stone carving, metallurgy, and there were no social classes except possibly for directing public works or rituals.

13. Emphasis was placed on segmented kinship society and there was no inter-village political organization.

As a second major item, the area co-tradition should show that links exist between sub-cultures or regions that may constitute evidence of their being subjected to the same general influences or streams of culture. These links in the Southwest are clearly manifested in the growth and parallel development of the following traits:

II-A. 1. Slab and basin metates progressed from troughed forms to large flat, concave slabs.

2. Pit-houses were replaced by multi-roomed, communal, surface dwellings.

3. Plain pottery gave way to both painted and textured types.

4. Notched hafted forms followed by grooved hafted forms were substituted for the earlier hand-axes.

5. Diagonal notched projectile points were replaced by lateral notched and triangular forms.

6. Sandals, textiles, and basketry were woven and appeared simultaneously. Sandals, not moccasins, were the typical footgear of the Southwest.

II-B. Other links showing mutual relationships are indicated by traits that are common to the whole area: the bone awl, bead and bracelet types, cylindrical pestles, mortars, hammer-stones, crystals, side-notched chipped blades, pottery

shapes (jars with necks, seed jars, shallow bowls) with an identity in geometric design-elements on painted pottery, and tubular stone pipes.

II-C. Other interrelationships and linkages exist which must have resulted from trading within the area. There is ample evidence of trade among the three groups: Anasazi pottery is found in Hohokam and Mogollon sites and Mogollon pottery in Anasazi and Hohokam sites; shells from the Gulf of California were used in manufacturing bracelets, beads, cut and carved shell, reaching the Mogollon and Anasazi by way of the Hohokam; and turquoise was also mined and traded.

III. The third requisite for the area co-tradition is that the unit under consideration must have definable limits in both space and time.

A. The space or area under consideration includes southeastern Utah, all of the eastern half of Arizona, the western three-quarters of New Mexico, southwestern Colorado, and the northern edge of Mexico. The "Greater Southwest" is not included for the reason that too little is known about it. In the future, parts or all of the greater Southwest may be drawn into this abstraction. I should add that the history of the Navaho and Apache is not included because it is not an integral part of the cultural continuum of the area.

B. The limits in time have been placed, on the basis of present knowledge, from about 2000 BC to AD 1700 or roughly about 3,700 years. The climax in the three cultures was roughly about AD 1100.

IV. The fourth and last essential of the area co-tradition is that the major cultural changes within the time periods should be more or less uniform although not necessarily identical.

The names that we have used for the major cultural changes in the American Southwest are not good, but they were the best that we could think of at the moment. As better ones are suggested or occur to us, they will be incorporated.

I. PRE-AGRICULTURAL AND PRE-CERAMIC STAGE

Dates from about 2000 BC to 1000 BC

The earliest stages of culture history in the Southwest are only imperfectly known for the Hohokam and Mogollon cultures and are totally unknown for the Anasazi. At the present time, the earliest culture about which we know anything is the Cochise, which has been dated by Carbon 14 at about 5500 BC.[8] Milling stones occur in all stages of the Cochise complex. It has been assumed

8 Carbon 14 dates presented in J. R. Arnold and W. F. Libby, *Radiocarbon Dates* (Science, vol. 113, no. 2927, 1951), p. 6: specimens nos. 216 and 511.

accordingly that food-gathering played the major part in the economy of these people with hunting in a secondary role.

It is also generally assumed that the Hohokam and Mogollon cultures grew out of the Cochise.[9] The ultimate origins of the Cochise are unknown. Thus, if our conjectures prove to be correct, the Mogollon and Hohokam cultures have a respectable antiquity.

The derivation of the Anasazi culture is unknown. Its earliest manifestations were discovered in the Falls Creek Caves near Durango, Colorado. The dates for these sites cluster around AD 200.[10] The significant cultural traits are pit-houses, the walls of which were totally unlike any other yet reported for the Southwest; corn and squash, atlatl, weaving and cordage. Pottery was not present. The stone tools vaguely resemble those of the Cochise (San Pedro) horizon, but specific counterparts of Cochise types are not present.

The first glimpse, then, that we get of the Anasazi culture is not very early. We can see on the basis of present evidence that there was a considerable time lag between the cultures of the north and the south. For by AD 200, the earliest Anasazi date, maize and squash had already been cultivated by the Mogollon people for at least 1,000 years[11] and pottery had been manufactured for several generations. Therefore, the earliest manifestations and origins of Anasazi culture are, at the moment, a riddle.

It must be admitted at the outset, then, that in the earliest time division of our co-tradition we can not show uniform rate of change for the major traits.

This does not trouble us, however, for we feel that with more knowledge, which will come from more digging, we shall surely have at our disposal enough data with which to reconstruct the earlier stages of Anasazi culture and to smooth out the lag which we mentioned earlier.

Parenthetically, the senior author would like to remark that when he expressed, twenty years ago, a desire to enter the field of Southwestern archaeology, he was told that it had been squeezed dry. As a matter of fact, we are now

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9 Emil W. Haury, *A Possible Cochise-Mogollon-Hohokam Sequence* (Proceedings, American Philosophical Society, vol. 86, no. 2, 1943); Martin and Rinaldo, *Cochise and Mogollon Sites*, particularly p. 208; E. B. Sayles, *The San Simon Branch: Excavations at Cave Creek and in the San Simon Valley: I. Material Culture* (Medallion Papers, Gila Pueblo, no. 34, 1945), p. 52.

10 Edmund Schulman, *Early Chronologies in the San Juan Basin* (Tree-Ring Bulletin, vol. 15, no. 4, 1949), p. 27; Earl H. Morris, *Basket Maker II Dwellings near Durango, Colorado* (Tree-Ring Bulletin, vol. 15, no. 4, 1949), pp. 33-34.

11 This dating is supported by the Carbon 14 date 2862 ± 250 years for the oldest dated maize level at Bat Cave. Arnold and Libby feel that, by extrapolation, the earliest maize level should be placed about 3000-3500 years ago (Arnold and Libby, *Radiocarbon Dates*, p. 6).

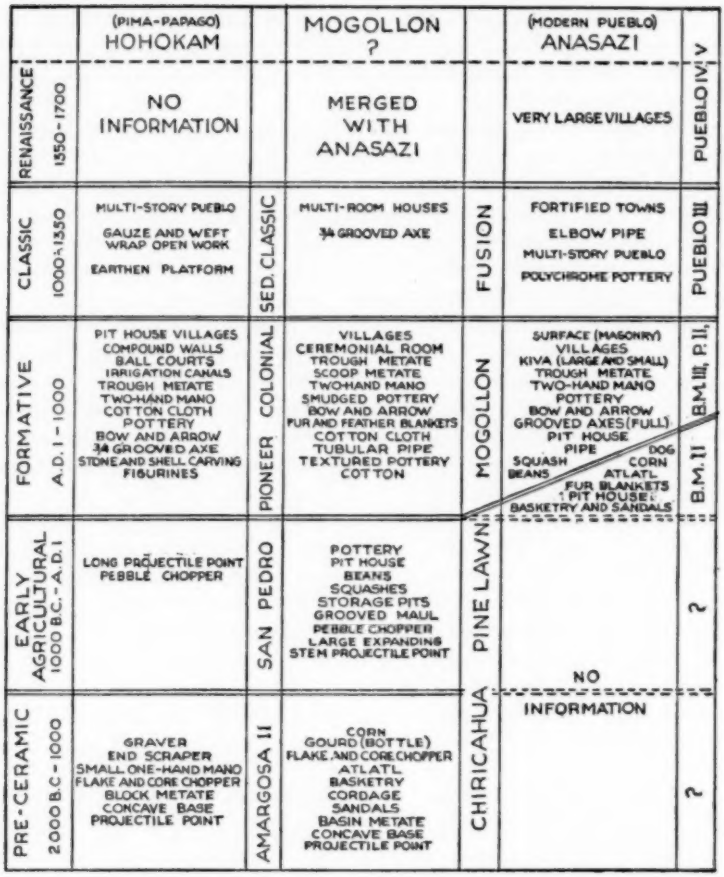

FIG. 1. The Southwestern co-tradition: a tentative outline of its principal characteristics.

just beginning to make some progress in the field and every day we are impressed by the fact that we have too little of the right kind of information. There is still much juice to be squeezed from this fruit!

II. EARLY AGRICULTURAL STAGE

The dates are about 1000 BC to AD 1

The recent excavations in Bat and Tularosa Caves, in New Mexico, and in Ventana Cave, in Arizona,[12] plus the numerous excavations in Cochise sites have given us excellent information for this stage.

Pit-houses were present and were roughly two and a half meters in diameter by one meter deep.[13] We know nothing about the superstructures.

The social organization may have been a nuclear family, with one family to a pit-house, or perhaps several nuclear families grouped together in bands constituting a hamlet or occupying a cave.

While food-gathering was certainly an important part of the subsistence pattern, we now know that maize-agriculture was present in part of the area at about 1000 BC or before.[14] Corn as we know it had probably already been domesticated several centuries before that. The evidence for these statements is based in part on the large amount of vegetal material from both wild and cultivated plans in Tularosa Cave. Most interesting is the corn. The total excavated corn material consists of about 38,000 cobs and cob fragments, a few of them with grains, and portions of some plants and tassels. Entire cobs comprise about one-sixth of the corn material in many levels, a relatively high figure for archaeological material and indicative of the excellent state of preservation in which the vegetal remains were found. From a standpoint of quantity, preservation, and diversity, this is the best collection which has ever been made. *Some of the corn in the lowest levels is the most primitive yet unearthed.* Practically all of it is weakly podded, and a few ears are so strongly podded that the grains are completely covered. The ears are of two major types: slender, ranging from slightly tapering to almost cylindrical; and rounded, occasionally almost ovoid. The latter is the more primitive and has not been described before.[15]

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12 Herbert J. Dick's field report at Point of Pines Conference in 1948; Martin, Rinaldo, et al., 1950 excavations in a Mogollon cave (in manuscript, to be published in 1952); Emil W. Haury, *Stratigraphy and Archaeology of Ventana Cave, Arizona* (Albuquerque, 1950).

13 Sayles, *The San Simon Branch.*

14 See footnote 11.

15 Hugh C. Cutler, *The Oldest Corn in the World* (Bulletin, Chicago Natural History Museum, vol. 22, no. 2, 1951), pp. 4-5.

Squash and kidney beans appeared soon after corn, although the bottle gourd appears in the earliest levels.

Storage pits were present.

Basin and slab metates and small manos were present. We formerly assumed that basin metates were used for crushing gathered wild foods. We now know that these metates were also present with the earliest corn. It is no longer possible, then, to postulate that basin metates were used only for grinding wild foods in the Southwest. About all we can safely say is that the presence of metates indicates that some kind of food was crushed and ground—with no other implication. Corn may have been present in the Southwest much earlier than 1000 BC.

Atlatls, choppers, mortars and pestles, percussion flaked tools, relatively large projectile points with expanding stems, flaked knives, full-grooved mauls, bone tools were the principal types of tools, utensils, and weapons.

Perishable materials consisted of wickerwork sandals of rigid material, basketry, skin moccasins, cordage and knots, snares of all sizes, prayer sticks, and flexible cradles.

The following traits were not present: pottery, metals, monumental stone carving, social classes.[16]

As explained earlier, these remarks hold true only for the Hohokam and Mogollon cultures since we now know of no Anasazi material of comparable antiquity. The earliest Anasazi site is dated at about AD 200.

III. THE FORMATIVE STAGE

The dates are circa AD 1 to 900 or 1000

In the earlier part of this stage, pit-houses of several varieties were built. These were grouped in villages varying in size from a few houses to as many as twenty. Towards the later half of the stage, the Anasazi developed various sized villages containing both pit-houses, which served as ceremonial units, and multi-roomed surface houses with walls of slabs and rubble and later of coursed ashlar masonry. To the south, surface houses with walls of stone never gained a foothold in this period. The Hohokam continued to build and occupy pit-houses but, in addition, they sometimes constructed a compound surrounded by a low wall, inside of which a number of contiguous, one-storied rooms were

16 Paul S. Martin and John B. Rinaldo, *Sites of the Reserve Phase, Pine Lawn Valley, Western New Mexico* (Fieldiana: Anthropology, Chicago Natural History Museum, vol. 38, no. 3, 1950), pp. 556-559.

erected. The compound wall served as one wall for the outer tier of rooms and it, as well as the interhouse walls, was composed of mud partly supported and strengthened by vertical posts. The Mogollones continued to occupy pit-houses. Ball courts for the Hohokam, large ceremonial structures for the Mogollon, and kivas, both great and small, for the Anasazi, were developed during this stage.

Corn, beans, squash were the principal crops. Cotton was introduced during this stage. Corn was ground either on trough metates with rectangular manos in a back-and-forth motion or in basin-type metates with a small one-handed mano in a rotary fashion. Basin-type metates or milling stones gradually dwindled in number and were finally replaced by the trough types. Corn planting was done with a digging stick. Irrigation was introduced in the south.

Pottery of several varieties was developed; the idea of pottery-making having been borrowed, in all probability, from Mexico. South of the Mogollon rim—generally speaking—pottery tended to be either basically brown, red, or buff—plain and textured—or decorated with simple geometric and sometimes realistic designs executed in red paint on a buff or brown background.

The dominance of the brown or red wares in the south seems to have been due to the fact that iron-bearing clays of volcanic origin were most easily accessible to the people of the Hohokam and Mogollon complexes.

In the north, Anasazi pottery was either plain or textured gray or decorated with a black paint on a gray or white background.

The designs throughout the area have many resemblances, although there are some exceptions.

Perishable materials consisted of plaited and coiled basketry, knotted netting included rabbit nets, plain-weave cotton cloth, braided sashes, twined fur and feather blankets, plain weave sandals of cordage and rigid materials (sometimes called wickerwork), string aprons, cordage.

Atlatl and dart were replaced by the bow and arrow, and grooved axes took the place of choppers. Added to the inventory of this stage were hoes, spindle whorls, more types of bone tools, tubular pipes, hammer-stones and diagonal-notched projectile points.

In addition, figurines came into vogue, being most popular in the south. Turquoise, disc beads, and thin shell bracelets were used for ornaments.

We assume, purely by inference, that the loom, ceremonies for rain-making, the use of colors for the cardinal points, and possibly the horned or feathered snake were present. Certainly these traits were present in the following period.

During this Formative stage many changes and technological innovations or

improvements occurred, as must be evident. It was, in a sense, an era of experimenting.

As in the previous stage, we have no evidence of a class system, of a priesthood (in the Mexican sense), of metallurgy, of large temples, or monumental stone carving, or of large public works except possibly irrigation canals, ball courts, or great kivas.

In general, as in the previous stage, the southern or Hohokam portion of the area seems to have been farther advanced in techniques and art forms than were an Anasazi. Well carved vessels, palettes, and effigies of stone, as well as etched and carved shell ornaments—to name merely a few—are completely absent from the Mogollon and Anasazi complexes.

IV. THE CLASSIC STAGE

Dated from about AD 1000 to 1350

Pit-houses were still occupied by the Hohokam, but contiguous surface rooms were becoming more popular. The Salado people had peacefully moved into the Hohokam area and had built large adobe walled, multi-storied pueblos, adjacent to the Hohokam surface jacal houses.

In the Mogollon area, surface, multi-roomed houses with walls of masonry had replaced the pit-houses.

Anasazi architecture showed the greatest development during this epoch. Surface, multi-roomed, storied houses with walls of excellent masonry were built in the open or in large caves.

In general, then, the population moved from semi-subterranean houses to surface dwellings, and in this instance, the earliest manifestation of the trend took place first among the Anasazi. Larger aggregates of population (towns) came into being.

During this stage the economy of the area remained the same. Improvements and modifications of the domesticated plants took place (e. g., more varieties of corn, beans, squash), but there were no innovations.

In ceramic manufacture and decoration technological advancement is evident. Textured pottery was manufactured and plain wares had all but vanished. We find, moreover, great artistry in the decorated pottery, especially the polychromes. Even in the black-on-white and red-on-buff wares one can observe more care and competence in the technique of finishing and painting.

Basketry and weaving show general excellence in manufacture, but no new techniques were developed. The Hohokam excelled in two types of weaving—

the gauze and the weft-warp openwork—but these styles did not spread northward.

In the category of stone-tool types, we can observe that there were more refinements in projectile points; that the three-quarter-grooved ax had spread from the Hohokam to the whole area; that the metates were either the troughed type with both ends open, or the slab type; that there were fewer chopping and scraping tools; and that among the Hohokam there was a general decline in the fine art of carving stone bowls and palettes.

The significant trends, then, of the Classic Period are these: technology was improved both in pottery-making and in production of tools of bone and stone; established subsistence patterns were extended such that a surplus of food provided more leisure time; the population increased; and with more people came larger centers of population, with new problems in social and political controls. Many villages were enclosed by masonry or adobe walls. While there were no real urban centers in the Southwest, we do know that fairly sizeable organized populations lived in large house units which followed a similar architectural pattern in much of the area. Kivas were numerous and carefully planned; ball courts had gone out of style, but their function may have been transferred to rectangular dance plazas. There was no political unity within the area as far as we can guess. Each town seems to have been completely independent in a political sense although each one actually conformed to a political pattern which was probably widespread in the Southwest. As a result of this disunity among towns, rivalry of all sorts may have been rampant. Squabbles and fights may have caused serious inter-town dissensions and these, plus any other troubles, may, as Titiev has suggested, explain withdrawals or abandonments of towns and areas.[17] The fact that some large towns were fortified attests to the fact that there were enemies abroad. But, there is a general consensus that the "Classic Period" was one of climax. A new high was reached in Southwestern culture as a whole.

We should like to call attention to one more interesting item that was present in this Classic Period. In the Hohokam area, earthen platforms have been noted. These were usually built within the town walls. Their function is not known. Is it not possible that this trait, like some others, was derived from Mexico and that on top of such a platform was built a sanctuary or houses occupied by a special class?

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17 Mischa Titiev, *Old Oraibi: a Study of the Hopi Indians of Third Mesa* (Papers, Peabody Museum of American Archaeology and Ethnology, vol. 22, no. 1, 1944).

V. THE RENAISSANCE PERIOD
About AD 1350 to 1700

The name "Renaissance" implies that in the preceding period a cultural retrogression had taken place. There was in fact a general decline from the cultural peak reached about 1300. Some of this deterioration may be ascribed to general instability and to the abandonment of certain areas. The reasons for the retrogression are not precisely known, but it is thought to have been due to a combination of several factors—social, religious, martial, and climatic. The main point here is that the decline was of short duration and when the people had completed their shifts, we find large new regroupings with attendant and significant changes.

Only the Anasazi culture remains for serious consideration. The area occupied by the Mogollon Indians was abandoned by this time. We conjecture that they moved northward and joined some Anasazi group such as the Zuñi.

The Hohokam culture had reverted curiously enough to a stage similar to that of AD 200 or 300.

The Anasazi culture, however, took a new lease on life. The inter-migrations and additions of new population increments to certain villages seem to have produced what might be called "hybrid vigour."

Villages or towns became large, sometimes covering an area of ten acres and housing perhaps 800 or 1000 people.

These towns were usually built in the open and consisted of a square, rectangular, or oval mass of contiguous rooms, arranged in tiers, and grouped about one or more plazas or patios. The kivas were located below the plaza floors.

As in the past, subsistence was based on agriculture plus some hunting. No new plants were domesticated. The importance of agriculture was recognized and may have been tied up with religious and social aspects of culture.

The pottery abruptly changed in character, although among the designs, many old friends may be recognized. The shift in pottery was manifested in color, painting technique, and placement of designs. Black-on-white ware disappeared and in its place one finds black-on-yellow wares, polychrome wares, and glazed wares. Hopi pottery was fired by locally mined soft coal.

There were no outstanding innovations in basketry, weaving, tool types, ornaments, costume, or pipes.

Kivas were round or rectangular, sometimes above ground but often subterranean. The walls of kivas were decorated with birds or mythological beasts instead of with simple geometric designs. Absent in this period, as in all others,

are the following traits: metallurgy, monumental stone carving, and marked class distinctions.

All in all, the Anasazi people of this period were well launched on a cultural expansion that was probably unparalleled in the Southwest. But further advancement was blocked by the invasion of the Spaniards.

We may state that the Renaissance Period exhibits several characteristics: (1) the withdrawal of the Salado people from the Hohokam area (where they went is not known); (2) an enormous recession in the Hohokam culture from the peak of the previous period; (3) the abandonment of vast areas such as the Four Corners region, the Flagstaff region, and the Mogollon region; and (4) a great resurgence of vitality in the Anasazi culture which was now restricted to the Hopi, Zuñi, and the Rio Grande areas.

Large new towns came into being or old ones doubled or tripled their size. Black-on-white pottery was replaced by black-on-yellow wares, glazed wares, and several new polychrome types. It was an era of consolidation, although some advances were made in ceramics; and craftsmanship in weaving, manufacture of stone and bone tools, and in architecture was maintained at a high level, but with no significant innovations. Agriculture was practised as in former periods and no new crops were introduced.

The chances are that the Anasazi culture would have made new and significant developments had it not been blighted by the conquest.

The groupings and listings given in this paper are not new; but we happen now to be in a better position to document our previous conjectures—namely, that there were uniformities and fairly even levels of cultural development throughout the Southwest. At about the beginning of the Christian Era there were three cultures on the horizon, each readily distinguishable on stylistic grounds. Yet all seemed motivated by similar impulses to change in more or less the same direction at about the same time. And all reached a climax at about AD 1100. It is as if the area had been washed over several times by waves of similar cultural influences.

To recapitulate: We have described the Southwestern Co-tradition in terms of five major time divisions. These are by no means to be interpreted as fixed or final.

The first period is the Pre-Agricultural and Pre-Ceramic Stage (about 2000 BC-1000 BC). All the available information for this period is based on our knowledge of the Cochise culture. We should like to point out that the

economy was based primarily on food-gathering and secondarily on hunting. The early history of the Anasazi culture is unknown.

The second period is the Early Agricultural Stage, dated at about 1000 BC to AD 1. The significant characteristics are: maize-agriculture, food-gathering, pit-houses, basin or slab metates, basketry, sandals, the atlatl, and the digging stick. Corn and squash were the first domesticated plants to have been used, and they were followed later by beans. Agriculture was present several centuries before pottery appeared. It is largely an agricultural but pre-pottery stage.

The third period, called the Formative Stage, dates from about AD 1 to AD 1000. This was an era of development and experimentation. Landmarks for this period are: pit-houses; multi-roomed surface houses of jacal construction or of slabs and rubble, and of ashlar masonry; walled compounds; ball courts and kivas; corn, beans, and squash; pottery; weaving of cloth, sandals, and baskets; the bow and arrow; figurines and possibly rain-making ceremonies with the associated symbols. The clothing pattern was based on the breech clout, string aprons, cotton and feather-fur blankets, ponchos (?), and skin robes.

The fourth stage we have designated the Classic Period and have set its limits as running from about AD 1000 to AD 1350. The salient characteristics are: surface and multi-roomed, storied houses; larger towns; a general movement of the people from semi-subterranean dwellings to surface houses; same crops as in the previous period (corn, beans, squash); technological advancements in ceramic manufacture, in production of stone and bone tools, and in weaving and basketry; an increased number of kivas that were standardized and well built; dance plazas; and an absence of ball courts. More leisure may have resulted from storage of crops.

The fifth period, the Renaissance, is dated at about AD 1350-1700. The Hohokam culture suddenly reverted to a state resembling that of the earliest times and therefore is more or less out of the picture. The Mogollon people abandoned their mountain stronghold and perhaps merged with some Anasazi groups. The Anasazi alone were left in the field, and they advanced to new levels of achievements. The significant characteristics are: a shrinkage of the total area occupied by Anasazi people; fairly large towns composed of kivas and storied, multi-roomed buildings; new pottery types; a maintenance at a high level of all arts and crafts; and no innovations in agriculture.

Absent throughout all these periods are the following: metallurgy, massive construction of temples; domesticated animals except the dog and perhaps the turkey; and political unity and class distinctions.

It is now possible for the culture historian to detect enough identities and similarities to create a conceptual scheme—the Southwestern Co-tradition—which may be a useful tool in tracing man's achievements, in seeing and appraising man and his deeds, and in creating comparative histories.

The names used here are not entirely satisfactory, and better ones will be sought. Perhaps more details could be added, but we hope to publish these in charts and tables. We wish we could explain why certain Hohokam materials or traits never penetrated most of the Anasazi area; or why Anasazi materials traveled so far and so often; or why the culture of the Southwest was more or less self-contained and non-expansive.

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THE INQUIRY INTO THE HISTORY OF THE HAZARA MONGOLS OF AFGHANISTAN[1]

ELIZABETH E. BACON

ONE OF THE PUZZLES which confronts students of Afghanistan is the presence there of Mongols interspersed among Afghans, Persians, and Turks. Very little information has been available concerning them, and the circumstances of their coming to Afghanistan have been a matter of conjecture rather than of history.

The best known of these Mongol peoples are the Hazara Mongols, or Hazaras, whom the writer visited in 1938-39 for ethnographic study. That they were Mongoloid was attested by their sparse beards and high cheekbones. That they were Mongols seemed probable enough in view of the general history of the area. That they were descended from military garrisons left in Afghanistan by Chinggis Khan in the early part of the thirteenth century AD, as is frequently stated by European writers, seemed open to question. If the ancestors of the Hazaras came directly from Mongolia to Afghanistan, why did their language, an archaic Persian, contain so many more Turkic words than Mongol?

Since the writer was interested in comparing the culture of the Hazaras with that of the medieval Mongols, it seemed wise to determine as precisely as possible the historical relationship between the two peoples. Tracing the history of the Hazaras was not an easy task. Central Asia, including both Mongolia and Afghanistan, lies on the fringes of the historical world. For the Mongols we have *The Secret History*, originally compiled by anonymous Mongol authors ca. 1240 AD. For Afghanistan we have the *Tabakat-i Nasiri* of Minhaj-ud-Din, who was an officer in the Ghurian army which resisted Chinggis Khan when that Mongol conqueror invaded Afghanistan. Other than these two works we are dependent on historians who were primarily concerned with events in Iran, China, or, somewhat later, in Turkestan. At times these historians follow events into central Afghanistan; at others they turn their attention elsewhere, leaving an historical void. Thus one can do no more than assemble such fragmentary data as are available and from these infer the general outlines of Hazara history.

The Hazaras, who number approximately half a million souls, dwelt until the end of the nineteenth century in the Hazarajat, a mountainous region ex-

1 The research for this paper was done under a Grant-in-Aid from the Social Science Research Council.

tending from a few miles west of Kabul westward about half way to Herat, and southward from the main spine of the Hindu Kush toward Ghazni and Kandahar. The Hazaras are divided into a number of tribes, of which the Besud, Dai Zangi, and Dai Kundi, just south of the main line of mountains, form a stable core. On the northern slopes of the mountains are the Yek Aulang; just east of the Hazarajat proper are the Timuri. To the south, ranged from east to west

FIG. 1. Places in Afghanistan and adjoining regions mentioned in the text.

in an arc around the central tribes, are the Dai Mirdad, Ghazni Hazaras (Chahar Dasta, Muhammed Khwaja, and Jaghatu), the Jaghuri, the Urazgani (made up of the formerly independent tribes of Dai Khitai and Dai Chopan), and the Polada. At the end of the nineteenth century many Hazaras, consequent on an unsuccessful revolt against the Afghan Government, migrated to Quetta in Baluchistan and Meshed in Iran. Hazara colonies remain in these two areas today. Many, however, returned to Afghanistan and settled in Afghan Turkestan, north of the Hindu Kush, where they were granted land. Almost no Urazgani remain in their former home, and many Jaghuri are to be found in Turkestan or abroad. The writer has not been able to obtain sufficient data on the groups in Turkestan, however, to indicate their location with any accuracy.

THE ORIGIN OF THE HAZARAS

The Hazaras themselves have no precise traditions of their origins. Of several informants questioned by the author, only two had ever heard of Chinggis Khan. One had heard the name, but did not know to what it referred. The second reported that descendants of Chinggis Khan were to be found among many of the Hazara tribes; that they kept their genealogies written in a little book, and

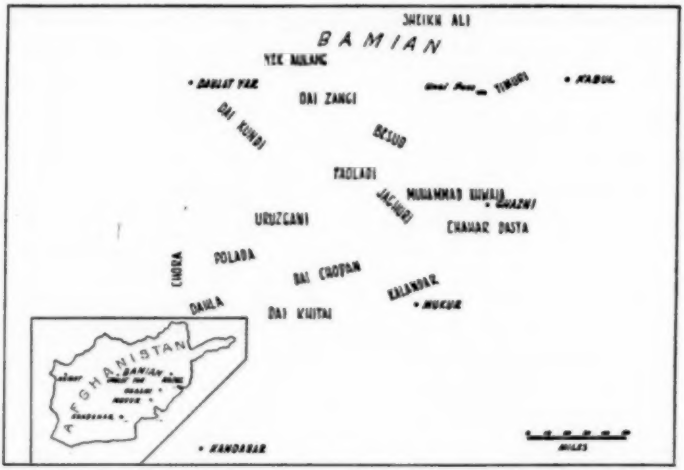

FIG. 2. Location of the Hazara Mongol tribes (based on data given in the Geographical Section, No. 3919 Quarter Inch Map Series, published by the War Office, 1941-1942; and on other information).

that they were called Jɔberi Ansor.[2] The same informant said that the Western Hazaras "had been workers for Chinggis Khan and the Mongols."[3]

Elphinstone, who traveled among the Hazaras in the early part of the nineteenth century, reported that "they have no account of their own origin . . .,"[4] although "they themselves acknowledge their affinity to" Moguls and Chagatyes, "as well as to the Calmuks now settled in Caubul."[5] Ferrier, traveling through

2 Another informant, when asked about the name Jɔberi Ansor, replied that he had never heard of it.

3 The Western Hazaras are a group of Mongols living in western Afghanistan and adjacent parts of Iran.

4 Mountstuart Elphinstone, *An Account of the Kingdom of Caubul* (2nd ed., London, 1842), vol. 2 p. 202.

5 *Idem*, vol. 2, p. 203.

Afghan Turkestan a few years later wrote of "Mongols" near Seripul who "pretend to have been settled there by Ghengis Khan."[6]

Schefer reported that "Les Hézarèh fixés dans les environs de Dèh Koundy se donnent comme les descendants d'un Arabe de la tribu de Qoreïch."[7] That the Hazaras should be of Arab descent is visibly incorrect. He may, however, be referring to *seyyids,* who trace their descent from Muhammed, and who are to be found scattered among the Hazaras.

The most circumstantial tradition is that recorded by Elias[8] as

> the view of the origin of his people which was held by a chief of the Hazára of Turbat-i-Jám, who died in 1894 . . . [that] the present Hazára belonged to one of the chief sections, or largest tribes, of the Moghuls. They rebelled against Chingiz Khan, who ordered them to be removed from Moghulistan to the Kohistán of Kabul. This order was being carried out, but Chingiz died just as the Hazára had crossed the Oxus. One of Chingiz's sons [descendant may be meant] moved part of them to the Kohistán of Kabul; but some effected their escape and settled in Bádghis.

When one turns to historical records, there seems little basis for the often reported statement that the Hazaras are descendants of military colonists planted in Afghanistan by Chinggis Khan at the beginning of the thirteenth century.[9] This statement may be traced back to the so-called *Tarikh-i Wassaf,* written by 'Abdullah b. Fadlullah of Shiraz at the beginning of the fourteenth century. The Persian text is not available to this writer. D'Ohsson, drawing on Wassaf, wrote as follows:[10]

> Tchinguiz-khan avait ordonné à ses quatre fils de fournir chacun un régiment de mille hommes pour former ce corps qui resterait cantonné dans les districts de Schébourgan, Talécan, Ali-Abad, Gaounk, Bamian et Ghaznin. Ces troupes firent des invasions dan la partie septentrionale de l'Inde.

6 J. P. Ferrier, *Caravan Journeys and Wanderings in Persia, Afghanistan, Turkistan, and Beloochistan* (London, 1856), p. 231.

7 Charles Schefer, "Khorassan" (extracted from Vol. 9 of the *Fihris out Tewarikh* of Riza Qouly Khan, appearing as Appendix I to *Histoire de l'Asie Centrale* by Mir Abdoul Kerim Boukhary, in *Publications de l'Ecole des Langues Orientales Vivantes,* Paris, 1876), p. 265.

8 Mirza Muhammad Haidar, Dughlát, *Tarikh-i-Rashidi* (London, 1898, appendix by N. Elias), p. 494d. This chief was probably a Western Hazara. The Kohistan of Kabul lies just north of Kabul, and just east of the Hazarajat, and is not now peopled by Hazaras. Badghis lies north of Herat.

9 See H. W. Bellew, *Afghanistan and the Afghans* (London, 1879), p. 204; H. W. Bellew, *The Races of Afghanistan* (Calcutta, 1880), p. 114; Joseph Hackin, *In Persia and Afghanistan with the Citroën Trans-Asiatic Expedition* (The Geographical Journal, vol. 83, 1934, pp. 353-363), p. 357; Sir Henry H. Howorth, *History of the Mongols from the 9th to the 19th Century* (4 vols., London, 1876-1888), vol. 3, p. 42.

10 Baron C. d'Ohsson, *Histoire des Mongols, depuis Tchinguiz-Khan jusqu'à Timour Bey ou Tamerlan* (4 vols., Le Haye and Amsterdam, 1834-35), vol. 2, p. 280.

Hammer-Purgstall gives the following translation:[11]

Er [Dschengis-Chan] befahl seinen vier Söhnen jeder mit dem Emire eines Hesare (tausend Mann) bis an die Granze Hindostan's und die Districte Schaburghan, von Talikan und Aliábád, Kaweng und Bamian, bis nach Ghasnin vorzudringen.

Hammer-Purgstall's use of *vorzudringen* bears out the impression given by other historical accounts of Chinggis Khan's expedition to the west, that his activities in Afghanistan were limited to brief thrusts in which the armies were withdrawn after the immediate objective had been attained.

One obtains an understanding of the nature of Chinggis Khan's expedition into Afghanistan from the account of Minhaj ud-Din Juzjani, who served the kingdom of Ghur[12] during the period when Chinggis Khan's armies were ravaging the land (1220-1225 AD), and who took part in the defense of one fortress. He was thus able to recount events with the detail possible only to a contemporary observer. Minhaj ud-Din writes:[13]

From thence [Tirmid][14] the Chingiz Khan despatched bodies of Mughal troops down towards Khurasan, Ghur and Ghaznin.

The whole of the cattle and flocks that were around about the cities, towns, kaṣrs, and villages of Khurasan, Ghur, and the Garm-sir, fell into the hands of the Mughal forces; and the country as far as the gate of Ghaznin . . . was ravaged, and the greater part of the Musalman inhabitants were martyred and made captive.[15]

In this same year[16] likewise, the army of Mughals under the Juzbi, Uklan, appeared before the gate of the city of Firuz-Koh, and attacked it with great ardour for the space of twenty-one days, but did not succeed in getting possession of it, and they withdrew baffled in their attempt. When the winter season drew near, and the snow began to fall upon the mountains of Ghur, the Mughal forces turned their faces from Khurasan towards Mawara-un-Nahr.[17] The number of the Mughal army which was in Ghur, Mughals and renegades included, was about 20,000 horse, and the route of that force lay by the foot of the fortress of Tulak,[18] and, for a period of eight months, a force from that army used to carry their raids up to the foot . . . of that fortress. . . .[19]

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11 Hammer-Purgstall, *Geschichte Wassaf's* (Wien, 1856), p. 24.

12 Ghur was a Tajik (Iranian) kingdom which had its capitol near Herat and which included within its limits much of the present Hazarajat.

13 The Maulana, Minhaj-ud-Din, Abu-'Umar-i-'Usman, *Tabakat-i-Nasiri* (Major H. G. Raverty, tr., 2 vols., London, 1881), vol. 2, p. 1005. This was in 1220 AD.

14 The present Termez, on the Afghan-Soviet border.

15 *Op. cit.*, vol. 2, p. 1006.

16 617 AH–1220 AD.

17 Transoxiana, the area north of the Oxus River.

18 The fortress where Minhaj ud-Din was stationed.

19 *Op. cit.*, vol. 2, p. 1007.

In the spring of 1221 Chinggis Khan is reported to have appointed a governor over Ghazni before leading his army eastward toward the Indus.[20] The governor was apparently not supported by any considerable garrison, for while Chinggis Khan was occupied with the Indus campaign the people of Ghazni revolted, and in 1222 Ogotai was sent to destroy the city.[21] Further corroboration that Mongol governors, where appointed, were not supported by garrisons of any size, comes from Herat. There the governor seems to have been supported by only a small bodyguard. Once the governor was lured out of his stronghold in the city, the Herati disposed of the guard with little difficulty.[22]

While Chinggis Khan was occupied with his Indus campaign, during

> . . . the month of Rabi'-ul-Awwal of the year 618 H . . .[23] the Mughal hosts, a second time, were despatched into different parts of Khurasan, Ghur, and Gharjistan. . . .[24]
>
> When the new year, 619 H.,[25] came round, again the Mughal forces from Khurasan, Ghaznin, and Sistan, entered the different parts of the mountain tracts of Ghur.[26]

During the winter of 1222-23 Mongol troops again operated south of the Hindu Kush:[27]

> From Gibari, in the depth of the winter season, he [Chinggis Khan] despatched Uktae [Ogotai] with an army of Mughal troops into Ghur and Khurasan. Uktae reached a place situated between Ghur and Ghaznin which they . . . call Pul-i-Ahangaran . . ., near unto Firuz-koh, and there Uktae pitched his camp. . . . Uktae likewise sent the Nu-in, Ilji, into the hill-tracts of Ghur and Hirat. In short, Shahnahs [Intendents] and bodies of troops were appointed to proceed into every part of Ghur, Khurasan, and Sistan; and, during the whole of that winter, those bodies of troops from the Mughal forces, which had entered into those different territories, carried slaughter into all the townships and villages thereof.

According to d'Ohsson it was in the summer of 1223 that Ogotai for the first time appointed civil governors, *dorogas,* to the conquered cities,[28] but no

20 d'Ohsson, vol. 1, p. 305; Howorth, vol. 1, p. 90.

21 d'Ohsson, vol. 1, p. 310.

22 d'Ohsson, vol. 1, pp. 311-312, based on a late fifteenth century manuscript, *Kitab Raouzat ul-Djennat fi Evssaf Médinet il Hérat,* "Gardens of Paradise, or Description of the province of Herat," by Moa'yen-ed-din Mohammed El-Esfezari.

23 1221 AD.

24 Minhaj-ud-Din, vol. 2, p. 1008.

25 1222 AD.

26 Minhaj-ud-Din, vol. 2, p. 1065

27 Minhaj-ud-Din, vol. 2, pp. 1047-48. See also d'Ohsson, vol. 1, pp. 313-314, 317-318.

28 *Op. cit.,* vol. 1, p. 317, based on "History of the First Four Khans of the House of Tchinguiz-khan," by the Archimandrite Hyacinthe, containing a translation of the *Thoung-kian-kang-mou,* which is an historical abridgement of the *Taï-Yuan-tong-tchi,* a collection of laws made under the emperors of the Chinggis Khan dynasty (see d'Ohsson, vol. 1, p. ix).

mention is made of garrisons assigned to support these civil governors. Shortly thereafter Ogotai rejoined his father on the upper Indus. After an unsuccessful attempt to return to Mongolia by way of Tibet, the Mongol armies returned to Peshawar and proceeded north across the Hindu Kush. Except for a pause at Balkh to slaughter such inhabitants as had returned to the destroyed city, no further campaigns are recorded in Afghanistan for Chinggis Khan and his armies before they crossed the Oxus.[29] Early in 1224, while Chinggis Khan was wintering in Samarkand, three Mongol regiments invaded northern Iran from Transoxiana and destroyed a number of cities which had survived or recovered from the earlier depredations of the Mongol generals Chebe and Subutaï,[30] but following this brief incursion, Chinggis Khan and his armies returned to Mongolia, where the great leader died in 1227 AD.

There is no indication that any Mongol troops were left south of the Oxus River.[31] One son of the Sultan of Khwarezm, who had originally provoked Chinggis Khan's conquest of the west, made himself master of Khorasan, Mazanderan, and 'Iraq, that is, all of northern Iran.[32] The eldest son, Jelal ud-Din, whom Chinggis Khan had pursued to the Indus, returned from his refuge in India in 1223, even before Chinggis Khan had crossed north of the Hindu Kush. He appointed a governor over Ghazni and Ghur, moved through southern Iran, and by 1225, just as Chinggis Khan was returning to his *ordu* in Mongolia, Jelal ud-Din had brought his brother to submission, and was ruler of most of Iran.[33]

When, after the death of Chinggis Khan, this conqueror's empire was divided among his four sons, none of the royal appanages included territory south of the Oxus.[34] It was necessary for his successors to reconquer this western part of the empire. A Mongol army appeared in northeastern Iran in 1227, and won a technical victory over Jelal ud-Din at Ispahan, but Mongol losses were so great that the survivors were obliged to retire again beyond the Oxus.[35]

As soon as Ogotai was enthroned as emperor in 1229, an expedition was dispatched westward from Mongolia to deal with Jelal ud-Din. This army was

29 d'Ohsson, vol. 1, pp. 317-320.

30 *Idem*, vol. 1, p. 349.

31 Raverty writes concerning the statement that Chinggis Khan had appointed *doroghas* to the conquered cities in the west: "Troops, too, would have been required, but none are mentioned, and the subsequent proceedings, after his death, prove that no Mughal troops were left behind in I-ran-Zamin, i.e., west of the Jihun [Oxus], and it is very doubtful whether any Daroghahs were" (Minhaj-ud-Din, vol. 2, p. 1082, footnote).

32 d'Ohsson, vol. 3, pp. 2-3.

33 *Idem*, vol. 3, pp. 5-10; vol. 1, p. 323.

34 *Idem*, vol. 2, p. 2.

35 *Idem*, vol. 3, pp. 22-27.

joined in Turkestan by troops under Chin Timur, then governing Khwarezm for the family of Juchi, eldest son of Chinggis Khan. While the main army proceeded against Jelal ud-Din, Chin Timur remained in Khorasan as governor of that province.[36]

According to Minhaj ud-Din, a second army was sent by Ogotai towards Ghazni under a leader called Mangutah, who was given control over Tokharistan, Kunduz, and Talikan, that is, the northeastern portion of Afghanistan.[37] A force was also dispatched to Herat and thence to Sistan, and after the accession of Ogotai to the throne, Taïr Bahadur, leader of the Sistan troops, was ordered to proceed to Ghur and Ghazni.[38] This army must have remained in the region, for Minhaj ud-Din writes[39] that

> the territory of Ghaznin, and Karman, remained in the hands of the Mughal Shahnahs [Intendents], until the year 639 H.,[40] when the Mughal forces, and the troops of Ghur, were directed to advance to Lohor.[41]

When Mangu Khan ascended the imperial throne in 1251 it was decided in the imperial *quriltai* that Mangu's brother, Hulagu, be sent to Iran at the head of a major expedition.[42] Hulagu, who arrived in the west in 1256 AD, gave his attention to the conquest of the Ismaili in northwestern Iran, of the Muslim Caliphate at Baghdad, and of Syria, but did not concern himself with Afghanistan. Indeed, at the coronation of Mangu Khan the whole territory extending from Herat to the Indus was given in appanage to a descendant of the Tajik dynasty which had ruled Ghur prior to Chinggis Khan's invasion.[43]

Hulagu's successors, the Mongol Ilkhans of Iran, made little attempt to bring the area now known as the Hazarajat under their control. Khorasan, the northeastern province of Iran, was traditionally administered by the heir to the Ilkhanate, and the Badghis region, just north of Herat, was a favorite headquar-

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36 d'Ohsson, vol. 3, pp. 47, 103; Minhaj-ud-Din, vol. 2, pp. 1109-10. Although Chin Timur was himself a Turk, he is reported as being assisted by four representatives of the family of Chinggis Khan (Howorth, vol. 3, p. 15). As d'Ohsson points out, the Mongol troops inherited by Chinggis Khan's sons as part of their appanages formed only a nucleus of their armies, which were recruited chiefly from peoples native to the appanage (d'Ohsson, vol. 2, pp. 5-6, footnote). In the thirteenth century the population of Transoxiana was largely Turkish.

37 Minhaj-ud-Din, vol. 2, p. 1109.

38 *Idem*, vol. 2, pp. 1119-26. According to Minhaj-ud-Din this army reached Sistan in 625 AH (1228 AD), that is, before the coronation of Ogotai.

39 *Idem*, vol. 2, pp. 1131-32.

40 1241 AD.

41 In India.

42 d'Ohsson, vol. 3, pp. 134-135.

43 *Idem*, vol. 3, pp. 129-131.

ters for Mongol troops in the province.[44] Herat and the lands running eastward were ruled by the Tajik dynasty of Kert, whose vassalage to the Mongol Ilkhans was often only nominal.[45] To the south, Sistan was under the control of the independent Nikudari, who appear to have been a mixture of Mongols and Tajiks, who used Sistan as a base for their brigand raids.

But if the descendants of Hulagu were not interested in what is now central Afghanistan, Mongols centered to the north of the Oxus were. On the death of Chinggis Khan, the steppe country north of the Oxus had been given in appanage to his son Chagatai. Chagataians made raids into Khorasan whenever the control of the Ilkhanate armies was weak. Farther east, where there was little resistance, the Chagataians crossed the Hindu Kush at frequent intervals in the hope of gaining for themselves the riches of Hindustan. During the twenty-four years between 1282 and 1306 no less than nine major expeditions crossed the Indus.[46] Although they were unsuccessful in establishing a foothold in India, the Chagataians did gain control over the route to the Indus, and in the last decade of the thirteenth century Doua, the Chagataian governor of Transoxiana, granted in appanage to his son Coutlouc Khodja the countries of Ghazni, Sistan, Balkh, and Badakshan, together with an army of five toumens (50,000 men). Coutlouc Khodja made his winter quarters in Ghazni, his summer quarters in Ghur and Gharjistan.[47] This places Chagataian Mongols well within the lands of the modern Hazarajat.

Daud Khodja, son of Coutlouc Khodja, inherited his father's appanage early in the fourteenth century, but was forced north of the Oxus by an army of Uljaitu, Ilkhan of Iran (ruled 1305-1316 AD). Uljaitu, however, granted the country between Balkh and Kabul, Badakhshan and Kandahar, in appanage to Yassavour, a Chagataian leader who had transferred his allegiance to Uljaitu.[48] When Yassavour sought to become independent of the Ilkhanate as well as of the Chagataian Khan, armies from both Transoxiana and Iran were sent against him at Kandahar. Yassavour was killed, but his considerable following was apparently allowed to remain when the invading armies retired. Although the combined armies are said to have numbered 40,000 men, their leaders chose to buy off Yassavour's generals rather than undertake a military engagement.[49] This sug-

44 *Idem*, vol. 4, pp. 4, 121, 564-565, 605, 670, 674.
45 *Idem*, vol. 4, p. 181.
46 d'Ohsson, vol. 4, pp. 559-562.
47 *Idem*, vol. 4, pp. 268-269.
48 *Idem*, vol. 4, pp. 562, 568.
49 *Idem*, vol. 4, pp. 642-644.

gests that the Mongols were both numerous and well-intrenched in the Kandahar-Ghazni region.

In 1326 a Khan of Transoxiana invaded the area, but was defeated near Ghazni by the son of Choban, the great general of Chagataian origin who served several Ilkhans in Iran. Choban was stationed at Badghis at the time. Shortly thereafter, having incurred the displeasure of the Ilkhan, Choban was killed at Herat. It is possible that some of his sons and followers took refuge with Chagataian compatriots to the southeast,[50] although we have no statement to this effect.

With the death of Abu Sa'id in 1334 AD the Mongol Ilkhanate of Iran came to an end in effect, although the title of Ilkhan was held by various contenders until 1337. A period of anarchy and of historical obscurity followed the fall of the Ilkhanate. Concerning this period Browne writes of Iran:[51]

> Persia was . . . left to its own devices, and was divided between four or five petty dynasties. . . . The history of these dynasties is very intricate . . ., while the territories over which each held control were indeterminate, and their frontiers (if such existed) constantly shifting, and often—indeed generally—civil war prevailed between members of the same dynasty. . . .

For Afghanistan, except Herat under the Kert dynasty, historical records are almost entirely absent.

In 1380 AD Timur, a Chaghataian prince who made his capitol in Samarkand, invaded Iran. In 1381 he occupied Herat, which he placed under the control of his son Miran Shah; in 1389 Timur had put to death the last surviving members of the Tajik Kert dynasty.[52] In 1392 he conferred on his grandson Pir Muhammed, son of Jahangir, the government of the provinces of Kabul and Ghazni, Kandahar, Kunduz, and Bakalan,[53] and a number of generals with their troops were assigned to accompany the youth when he set out to take possession of his domain.[54] For the year 1399 it is recorded that four chiefs, "Seyud

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50 See below, page 246.

51 Edward G. Browne, *A History of Persian Literature under Tartar Dominion (A.D. 1265-1502)* (Cambridge, 1920), p. 160.

52 *Idem*, p. 180.

53 Major David Price, *Chronological Retrospect, or Memoirs of the Principal Events of Mohammedan History* (3 vols., London, 1821), vol. 3, p. 127; Petis de la Croix, *The History of Timur-Bec, written in Persian by Cherefeddin Ali, native of Yezd, his Contemporary* (English translation, 2 vols., London, 1723), vol. 2, p. 4; Quatremère, "Notice de l'ouvrage qui a pour titre: *Matla-assaadeïn ou-madjma-albahreïn*, et qui contient l'histoire des deux sultans Schah-rokh et Abou-Saïd" (in *Notices et Extraits des Manuscrits de la Bibliothèque du roi et autres bibliothèques, publiés par l'Institut Royal de France*, vol. 14, Paris, 1843), p. 51.

54 Petis de la Croix, *Timur-Bec*, vol. 1, pp. 384-385.

Khaujah, Sheikh Ally Bahauder, Jahaun Melek, and Peir Mahommed Pûlaud, with other distinguished chiefs attached to the government of Khorassaun, hastened to Herât. . . ."[55] It is possible that one of these chiefs, Pir Muhammed Pulad, may have been the founder of the modern Hazara tribe of Pulad.[56]

When Timur died in 1405 AD, he was succeeded by his son Shah Rukh, who reigned until 1447. Shah Rukh made his capitol in Herat, with his favorite summer quarters in the district of Badghis, north of Herat. Thus the center of gravity of political and military power which had been fixed in northwestern Iran under the Ilkhans, and in the plains of Turkestan under Timur, was shifted to western Afghanistan under Shah Rukh. In 1413 AD it was possible to write:[57]

> Aujourd'hui, grâce au Dieu très-haut, les provinces de Khorasan, de Khwarizm, de Zaboul, de Kaboul, jusqu'aux extrémités de l'Hindoustan . . . se trouvent soumis à l'autorité de nos serviteurs; et, de tous les côtés, nous commes sans inquiétude.

There is a specific reference to troops garrisoned at Badghis,[58] and in the winter of 1417 Shah Rukh established winter quarters on the Helmand River near Kandahar, whence he despatched officials toward Ghazni and Kabul, and among the Hazara tribes[59] to collect tribute. It was necessary for him to send a punitive expedition to enforce collection, a not uncommon occurrence in this area during more recent times, but in general it is clear that Shah Rukh was concerned, not with making a quick expedition of conquest into alien territory, but with the administration of his established domain.[60] Since the tribes of the area have never been noted for their docility, Shah Rukh must have maintained substantial garrisons at strategic points to give support to administrative officials.

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55 Price, *Chronological Retrospect*, vol. 3, p. 296.

56 See page 246 below.

57 Quatremère, *Matla-assadeïn*, p. 238.

58 *Idem*, p. 20.

59 See discussion of the use of the term Hazara, page 244 below.

60 "Shah Rokh returned from Kandahaur to the banks of the Heirmund, where he had determined to take up his winter quarters. . . . Ameir Ibrauhim the son of Hajuan Shah had, towards the end of the month of Ramzaun, already returned from his mission towards Kabûl and Gheznein, and announced that Mirza Keydou was on his way to the royal presence, in order to make his submission. Ameir Sheikh Lûkman Berlaus, on the contrary, who had been dispatched among the Hazaurah tribes, in order to collect the stipulated tribute, transmitted information that, after a residence of several days, instead of fulfilling their engagements, he found them disposed, under every possible pretext, to protract and elude the payments for which they had pledged themselves. In consequence of this, the Ameirs Mahommed Souffy, and Moussa, were necessarily employed by the order of the Shah, to over-run and lay waste the country; which having executed, and further sufficiently chastised the insolence of these refractory hordes, they rejoined the camp of their sovereign on the Heirmund" (Price, *Chronological Retrospect*, vol. 3, pp. 534-535, based on Kholausset-ul-Akhbaur).

Following the death of Shah Rukh's successor in 1447, the capitol of the greatly reduced Timurid domain was returned to Samarkand, and central Afghanistan returns to historical obscurity until the beginning of the sixteenth century, when the Timurid price Babur invaded Afghanistan and established his capitol at Kabul. By that time the Hazara Mongols were a distinct people, dwelling in much their present habitat.

The foregoing résumé of Mongol history in Afghanistan shows that the traditional statement made by modern writers concerning the origin of the Hazaras is incorrect. The available evidence indicates that while several expeditions were made into Afghanistan by the armies of Chinggis Khan, the troops withdrew again as soon as the object of the campaign had been accomplished. There is no suggestion that Chinggis Khan himself left any permanent garrisons in the region, although he may have paved the way for future Mongol settlement by killing off part of the former population of the mountain area.[61]

The region now known as the Hazarajat seems to have been peopled chiefly by Chagataians from Transoxiana. Other Mongols, and some Turks or Turco-Mongols may have joined these Chagataians. Troops stationed in Khorasan by the Ilkhans revolted against their monarch on more than one occasion,[62] and it is possible that some of these rebels sought refuge in the central mountains of Afghanistan, where they could more easily avoid possible punitive expeditions. Later, under Timur and his son Shah Rukh, troops and administrative officials were sent into the area, and it is probable that some of these remained when the Timurids returned to Samarkand.

Thus it would appear that the present Hazara Mongols are descended, not from military garrisons planted by Chinggis Khan, but from Mongol troops, many of them Chagataian, who entered Afghanistan at various times during the period from 1229 to about 1447 AD.

THE EVOLUTION OF THE HAZARAS AS A PEOPLE IN AFGHANISTAN

When the Emperor Babur invaded Afghanistan at the beginning of the sixteenth century, the Hazara Mongols were a distinct people, dwelling in approximately their present habitat. In order to understand the evolution of the Hazara tribes, it will be well to consider briefly the organization of Mongol armies and the terminology of the military units.

The Mongol armies were organized into units of tens *(arban)*, hundreds *(jä'ün)*, thousands *(mingġan)*, and ten thousands *(tümän)*.[63] The *tümän*, or

61 See above, page 235, footnote 27.

62 Browne, *op. cit.*, p. 176.

63 B. Vladimirtsov, *Le Régime Social des Mongols* (Paris, 1948), p. 134.

division, was probably more often than not an artificial unit from the point of view of tribal affiliations, since it is improbable that many tribes were sufficiently numerous to muster 10,000 fighting men. Vladimirtsov writes that among the Eastern Mongols of the fourteenth-seventeenth centuries the word *tümän* was used as the equivalent of the *ulus*, a large tribal grouping or feudal fief. For example, the Urianghat constituted a *tümän-ulus*, the Oirat comprised four *tümän-ulus*. But in this later period the *tümän-ulus* was not capable of furnishing a division of even approximately 10,000 fighting men.[64] Still later, the term *tümän* disappeared entirely from Mongol usage.[65] Under the empire of Chinggis Khan and his immediate successors, who had the power to dispose of troops as required by military needs, the assignment of regiments to a *tümän* seems to have been often arbitrary. At best, the *tümän* as a military unit represented the warriors of an impermanent tribal confederation.[66] Under the Western Mongol Ilkhanate the use of the word *tümän* appears to have fallen gradually out of use.[67]

The *mingġan*, on the other hand, seems to have corresponded to an effective social unit, which might be designated as tribe. The fact that the Mongol soldiers sent to the West were accompanied by their families and live stock emphasizes the social nature of the military units.[67a] Vladimirtsov writes:[68]

> Dans le cadre de leurs *mingġan* et *jäġün* les *noyan* mongols jouissaient généralement d'un pouvoir illimité, rendant la justice, appliquant les sanctions à leur subordonnées, dans l'esprit du Jasaq[69] et du droit coutumier en général.
>
> Des tribunaux spéciaux furent, il est vrai, institutés auprès des camps impériaux, mais "dans la steppe" toutes les questions judiciaires étaient probablement du ressort du *noyan*-chiliarque [chief of a thousand].

This description of the functions of the chiefs of thousands and of hundreds suggests strongly that they were not only military leaders in warfare, but also the chiefs of tribal units. Vladimirtsov writes:[70]

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64 *Idem*, pp. 171, 174, 175.

65 *Idem*, p. 200.

66 *Idem*, p. 175.

67 Rashid ed-Din, historian at the court of the Mongol Ilkhans at the beginning of the fourteenth century, occasionally used *tümän* for groups of a thousand, as if the word no longer had a very precise meaning (see Vladimirtsov, *Régime Social*, p. 135, note 5).

67a "Une quantité assez importante de troupes mongoles namades, c'est-à-dire de guerriers avec leurs familles, bétail et avoir, fut emmenée par les princes impériaux vers l'ouest, dans les *ulus* d'Ögädäi, de Čagataï, dans la Horde d'Or et en Perse" (Vladimirtsov, *op. cit.*, p. 162).

68 *Idem*, p. 152.

69 A codification of Mongol customary law made under Chinggis Khan.

70 *Idem*, p. 140.

En effet, élevé dans les idées de clan, Činggis-han constituait généralement un "millier" avec les représentants d'une même tribu-clan et plaçait à sa tête un *noyan* appartenant au même clan. Autrement dit, Činggis prenait simplement une unité déjà constituée, une lignée, un clan. . . .

Military divisions could not be expected to follow exactly the lines of social divisions. The great tribes, which could furnish many more than a thousand men, were frequently broken up into a number of *mingĝan* regiments which were assigned to service in different parts of the vast Mongol Empire.[71] Since even the smaller tribes were of varying size and could probably seldom be counted on to produce fighting men in units of a thousand, even the *mingĝan* on occasion was composed of members of different tribes.[72] Sometimes military expediency called for the recruiting of new regiments from several established ones. When Hulagu was preparing for his great western expedition, Mangu Khan ordered that a levy of two men in ten should be made on all the troops of Chinggis Khan which had been apportioned among the sons, brothers, and nephews of that monarch, to form the personal army of Hulagu.[73]

Nevertheless the *mingĝan* regiment seems to have coincided with the tribe to such an extent that even where members of different tribes were brought together in a regiment this originally military unit gradually took on the attributes of a tribe, including territoriality and a feeling of tribal solidarity. In Mongolia, in the fourteenth-seventeenth centuries, the term *mingĝan* disappeared, to be replaced by *otoq*, which was employed to designate a tribal grouping.[74]

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71 ". . . la répartition des patrimoines en 'milliers' consacrait l'éparpillement définitif de toute une série de grandes et anciennes tribus mongoles, Tatar, Märkit, Jajirat, Naïman, Käräit, par exemple, dont les vestiges se trouvaient, le plus souvent, dispersés à travers divers *ulus* et patrimoines-milliers" (Vladimirtsov, *Régime Social*, p. 142).

72 ". . . selon *l'Histoire Secrète:* 'Après avoir réparti le commandement sur les populations, il apparut que le peuple commandé par le charpentier Güčügür était en petit nombre. En vue de le compléter, Činggis ordonna de détacher plusieurs hommes du peuple de chaque chef et désigna (en qualité de) chiliarques Güčügür avec Mulqalqu du clan Jadarat.' 'Ensuite, Činggis donna l'ordre au pasteur de brebis Dädäi de rassembler tout le people sans feu ni lieu et de devenir son chiliarque' " (Vladimirtsov, *op. cit.*, p. 141). Both Güčügür and Dägäi were, according to Vladimirtsov, members of the Bäsut tribe.

"Les trois 'milliers" constituant le patrimoine d'Alčidai, neveu de Činggis-han, furent recrutés comme suit: 'certains étaient de la tribu Naïman, et certains étaient recrutés dans d'autres tribus' " (Vladimirtsov, *op. cit.*, p. 142, translating from Rashid-ud-Din).

73 "Tous les princes désignèrent parmi leurs enfants, leurs proches, leurs serviteurs, ceux qui devaient marcher à la suite de Houlagou: de là vient que dans nos contrés il a toujours existé et il existe encore des émirs qui sont les descendants et les parents de chacun des émirs de Tchinghiz-khan . . ." (Etienne Marc Quatremère, *Histoire des Mongols de Perse écrite en persan par Raschid-Eddin*, Paris, 1836, vol. 1, p. 133).

74 See Vladimirtsov, *Régime Social*, pp. 173-174.

In the west, the *mingĝan* was replaced by the Persian equivalent for "thousand," *hazara,* which, like *otoq* in the east, came to acquire the meaning of "tribe."

In Afghanistan, furthermore, by the fifteenth century, *hazara* meant not only tribe, but specifically "mountain tribe." At first it seems to have been applied to any mountain tribe, regardless of ethnic affiliations,[75] and the name Hazara is still applied to non-Mongol groups in Badakhshan, and in northwest India. By 1504, however, when Babur first writes of them, the name Hazara had become, through a shift in usage from the general to a specific group of mountain tribes, the proper name of the tribes of Mongol origin dwelling in the mountains of central Afghanistan.

Early in the fifteenth century Mongol tribes bearing the name Hazara were dwelling in what is now the Hazarajat,[76] and it is clear from Babur's accounts that by the beginning of the sixteenth century the name Hazara specifically referred to these Mongols.[77] Thus the Hazara Mongols had become established as a people in their present habitat by the beginning of the sixteenth century.

It is not easy to trace the names of modern Hazara tribes back to name groups of the Mongol period.

One of the largest of the Hazara Mongol tribes has the name Besud, a name which appears in the thirteenth century *Secret History of the Mongols,* which traces the origin of the tribe.[78] Vladimirtsov mentions three Bäsüt regiments in the army of Chinggis Khan: one composed entirely of members of the Bäsüt tribe,[79] and two others with Bäsüt leaders but a mixed following.[80] In the time of Timur there was a "hord of Bisoud" in Afghanistan near Kabul,[81] that is, in the vicinity of the present home of the Besud tribe.

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75 Minhaj-ud-Din, vol. 1, p. 221, note 1. See also Quatremère, *Matla-assaadeïn,* p. 484.

76 Price, *Chronological Retrospect,* vol. 3, pp. 534-535, based on Kholausset-ul-Akhbaur.

77 "On the west it [Kabul] has the mountain region in which are Karnud (?) and Ghur, now the refuge and dwelling-places of the Hazara and Nikdiri . . . tribes" (*The Babur-nama in English* [*Memoirs of Babur*] by Zahiru'd-din Muhammad Babur Padshah Ghazi: translated from the original Turki text by Annette Susannah Beveridge, 2 vols., London, 1912-21), vol. 1, p. 200. "In the western mountains are the Hazara and Nikdiri tribes, some of whom speak the Mughuli tongue" (*idem,* vol. 1, p. 207).

78 Paul Pelliot, *Histoire Secrète des Mongols:* Restitution du Texte Mongol et Traduction française des Chapitres I à VI (Paris, 1949), p. 128. See also E. Blochet, *Introduction à l'Histoire des Mongols de Fadl Allah Rashid Ed-Din* (E. J. W. Gibb Memorial Series, vol. 12, Leyden and London, 1910, Appendix, p. 289, based on the Yuan-Shao Pi-Sheu, the Chinese translation of the Secret History).

79 Vladimirtsov, *Régime Social,* p. 142.

80 *Idem,* p. 141.

81 Petis de la Croix, *Timur-Bec,* vol. 1, p. 315.

A modern sub-tribe of Besud is the Burjigai, a name strongly reminiscent of Borjigin, the Medieval Mongol *oboq* to which Chinggis Khan belonged.[82]

Another Mongol tribe was the Tatar, which originally lived in northeastern Mongolia.[83] According to Burnes, a nineteenth century explorer in Afghanistan, a sub-tribe of the Hazara tribe of Dai Chopan was named Tatar.[84] Although the name Tatar or Tartar came to be applied to Mongols in general by Chinese, Russians, and Europeans,[85] it seems more likely that a tribelet in the isolated mountains of Afghanistan should have retained the original name from the Mongol period than that it should have adopted an alien usage not usually encountered south of the Hindu Kush.[86]

One of the original Hazara tribes, according to modern Hazara tradition, was the Dai Khatai or Dai Khitai. It would be tempting to relate this tribe to the Khitans or Kara Khitai, a Tungusic or Mongol people, one branch of which ruled Turkestan until the beginning of the thirteenth century, another of which, in north China, became vassals of the Mongols under Chinggis Khan. However, the links of relationship, if there were such, cannot be traced.

One of this writer's informants gave Qarluq as the name of a sub-tribe of the Uruzgani. The Qarluq—a Turkic, not a Mongol tribe—were active in Transoxiana in the period immediately preceding Chinggis Khan's invasion of the west, and although many of the Qarluq fought with the armies opposing Chinggis Khan, some served with the Mongols in Tokharistan.[87] Qarluq remnants have been reported as surviving in northeastern Afghanistan,[88] and it is

82 Chinggis Khan's father founded the Qi'at Borjigin lineage of the Borjigin. The Bäsüt were formed by a similar branching off from the Borjigin several generations earlier (see Pelliot, *Histoire Secrète*, pp. 121-128).

83 Howorth believed the Tatars to be of Tungusic origin (see *History of the Mongols*, vol. 1, pp. 25-26, 700-703).

84 Lieut.-Col. Sir Alexander Burnes, *Cabool; being a Personal Narrative of a Journey to, and Residence in that City, in the years 1836, 7, and 8* (London, 1842), p. 229.

85 W. W. Barthold, "Tatar" (*Encyclopaedia of Islam*, vol. 4, pp. 700-702).

86 Ferrier writes that "The Hazara Tartars . . . are a small tribe settled amongst the mountains intersected by the river of Khulm and the river of Balkh . . .," that is, in northern Afghanistan (Ferrier, *Caravan Journeys*, p. 219). Masson speaks of Tatar chiefs resident on the Dasht Saféd, again north of the Hindu Kush (Charles Masson, *Narrative of Various Journeys in Balochistan, Afghanistan, The Panjab, & Kelat*, 4 vols., London, 1844, vol. 2, p. 307). These two Tatar groups might possibly have derived their name from the more general usage.

87 W. Barthold, *Turkestan down to the Mongol Invasion* (2nd ed., London, 1928), pp. 411, 441; Minhaj-ud-Din, vol. 2, p. 1132, footnote.

88 Gunnar Jarring, *On the Distribution of Turk Tribes in Afghanistan* (Lunds Universitets Arsskrift, N.F., Avd. 1, vol. 35, no. 4, 1939), pp. 71-73; Mirza Muhammad Haidar, p. 19, footnote 4.

possible that some might have become incorporated into an Hazara tribe. The presence of a Besudi sub-tribe among the Polada Hazaras indicates that tribal fractions did sometimes become affiliated with other tribes.

Vladimirtsov has pointed out that under the Mongol Empire the *mingğan* regiments were sometimes designated by the old tribal names, sometimes by the name of their leader.[89] Many of the Hazara sub-tribes are named after leaders of a former period, and it is possible that some of these date back to the period when the ancestors of the Hazaras were settling in Afghanistan.

One of the original Hazara tribes, now a sub-tribe of the Uruzgani, is the Dai Chopan. According to d'Ohsson, when a certain Khan of Transoxiana invaded Afghanistan in the year 1326 he was stopped near Ghazni by the Emir Husein, son of Choban, the great Mongol general who served the Ilkhans from Gaikhatu (1291-92 AD) to Abu Said (1317-34 AD). After the battle Husein returned to Herat.[90] Leech, who explored parts of the Hazarajat in the early nineteenth century, wrote:[91]

> Many of the names of villages in the immediate neighbourhood of Candahar prove a Hazarah founder; and the tomb of one of their progenitors, Choupan, is on the high road between Candahar and Herat near Greeskh.

This tomb, reputedly that of the founding ancestor of the Dai Chopan tribe, is in about the center of the fighting range of the fourteenth century Husein, son of Choban. Choban himself was executed in Herat by order of Abu Said, and his remains were buried at Medina. We know that Husein made his headquarters with his father in Badghis,[92] and it is very possible that when his family fell into disfavor with the Ilkhan, Husein retreated with his followers toward Kandahar. Thus the tomb mentioned by Leech may well be that of Husein, son of Choban.

A famous chief in the armies of Timur was Pir Muhammed Pulad.[93] The name resembles that of the tribe Polada, but the name Pulad appears not infrequently in the history of the Western Mongols, and it is not possible to trace the tribal name to this particular leader. So many different Zangi or Zengi

89 Vladimirtsov, *Régime Social*, pp. 142-143.

90 d'Ohsson, *op. cit.*, vol. 4, p. 670.

91 Major R. Leech, *A Supplementary Account of the Hazaras* (Journal, Asiatic Society of Bengal, vol. 14, new series, pp. 333-340, Calcutta, 1845), p. 333. Girishk is not far west of Kandahar.

92 d'Ohsson, vol. 4, pp. 669-675.

93 Price, *Chronological Retrospect*, vol. 3, p. 296.

are mentioned in the literature[94] that it would be unprofitable to speculate as to which, if any of them, might have been the founder of the Dai Zangi.

The names of many Hazara tribes and sub-tribes cannot be traced in the historical record. Some bear the names of historically unidentifiable founders, such as Sultan Ahmad, Darwesh Ali, Abdul. Some are descriptive, probably of the founder, although they might be proper names: Bacha-i Ghulam ("son of a slave"),[95] Mir-i Hazar (Emir or commander of a regiment), Daulat ("government") Khan.[96]

Some of the tribes or sub-tribes take their names from places. For example, the Yek Aulang tribe derives its name from a valley in the Hindu Kush which was already known by the name in the time of Timur.[97] The "Turkman Hazaras" mentioned by Babur appear to have derived their name from a place rather than from any supposed affiliation with the Turkomans.[98]

Other sub-tribes have such names as Zardalu (Persian, "apricot"), and Shirin (Persian "sweet").

Attempts to trace the origin of modern Hazara tribal names to Mongol tribes or to leaders who left their mark on western Mongol history can be only suggestive. Mongol tribal history is marked by a restless movement, a succession of alignments and realignments of the loyalties of leaders and their followers. When they entered Afghanistan, particularly the central mountain area, they stepped beyond the borders of recorded history. That names once fixed do not necessarily persist indefinitely is indicated by the fact that no tribal unit, so far as this writer has been able to discover, retains the name of Sultan-Mas'udi, which according to Babur was the most numerous Hazara tribe at the beginning of the sixteenth century.[99]

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94 Minhaj-ud-Din, vol. 1, pp. 175, 342; vol. 2, p. 1002; Howorth, vol. 3, p. 319; de Guignes, "Exposition de ce qu'il y a de plus remarquable (sur la terre) et des merveilles du roi tout-puissant. Par Abdorraschid, fils de Saleh, fils de Nouri, surnommé Yakouti. Ouvrage de géographie, composé dans le XV^e^ siècle" (in *Notices et Extraits des Manuscrits de la Bibliothèque du Roi*, vol. 2, pp. 386-545, Paris, 1789), p. 474.

95 Ghulam is, however, an Islamic name in good standing, so that Bacha-i Ghulam might be translated as "son of Ghulam."

96 Daulat might be derived from the Chagatain tribal name Dughlat.

97 Quatremère, *Matla-assaadein*, p. 120.

98 Beveridge, *Babur-nama in English*, vol. 1, pp. 251-252. Some of the Turkman Hazaras were reported camping at Dara-i-Khush, northwest of Kabul, of which Beveridge writes "it seems to be the Dara-i-Turkman of Stanford" (*idem*, vol. 1, p. 251, note 1). Masson, writing in the nineteenth century, speaks of the Hazara district of Turkoman (Masson, *Narrative*, vol. 3, p. 119).

99 *Babur-nama in English*, vol. 1, p. 221.

AREAS AND PERIODS OF CULTURE IN THE GREATER ANTILLES

IRVING ROUSE

IN PREHISTORIC TIME, the Greater Antilles were culturally distinct, differing not only from Florida to the north and Yucatan to the west but also, less markedly, from the Lesser Antilles to the east and south (Fig. 1).[1] Within this major province of culture, it has been customary to treat each island or group

FIG. 1. Map of the Caribbean area.

of islands as a separate archaeological area, on the assumption that each contains its own variant of the Greater Antillean pattern of culture. J. Walter Fewkes proposed such an approach in 1915[2] and worked it out seven years later.[3] It has since been adopted, in the case of specific islands, by Harrington,[4] Rainey,[5] and the writer.[6]

1 Fewkes, 1922, p. 59.
2 Fewkes, 1915, pp. 442-443.
3 Fewkes, 1922, pp. 166-258.
4 Harrington, 1921.
5 Rainey, 1940.
6 Rouse, 1939, 1941.

Recent work in connection with the Caribbean Anthropological Program of Yale University indicates that this approach is too limited. As the distinction between the two major groups of Indians in the Greater Antilles—the Ciboney and Arawak—has sharpened, it has become apparent that the areas of their respective cultures differ fundamentally, with only the Ciboney areas corresponding to Fewkes' conception of distribution by islands. The Arawak areas cut across the islands instead of enclosing them and, moreover, are sharply distinct during only the second of the three periods of Arawak occupation. It is the purpose of the present article to illustrate these points and to suggest explanations for them.

INDIANS OF THE GREATER ANTILLES

Columbus encountered three groups of natives in the West Indies: Ciboney, Arawak, and Carib. The first are poorly known, for they were restricted in colonial time to the western tip of Cuba, to the keys off the northern and southern coasts of that island, and to the southwestern corner of Hispaniola, regions which the Spaniards rarely penetrated before the Indians became extinct. The Ciboney are said to have lived in caves or camps; obtained their food by hunting, fishing, and gathering rather than agriculture; and to have had a relatively simple social and religious life. Since Columbus' Arawak interpreters could not understand their language, it is assumed to have been non-Arawak, although it might instead have been a different Arawak dialect.[7]

The Arawak occupied most of the rest of the Greater Antilles at the time of historic contact. They were agricultural, pottery-making Indians and lived in permanent villages rather than camps. According to the Spanish sources, they had a hereditary aristocracy; elaborate songs, dances, and ceremonies; and an emphasis upon religion, centering in the worship of spirits known as *zemis*. They were peaceable and did not practice cannibalism.[8]

By contrast, the Carib were cannibals and emphasized warfare. They spoke a language different from that of the Arawak; may have relied more upon fishing than upon agriculture; lived in semi-permanent villages; had less of an interest in religion; and chose their leaders for their prowess in fighting rather than on the basis of inheritance. They centered in the Lesser Antilles, and, by the time of Columbus, had established advanced bases in the Virgin Islands and on

7 García Valdés, 1948. Some Cuban anthropologists, e.g., Cosculluela (1946), have substituted the term "Guanajatabey" for "Ciboney" on the assumption that the latter more properly applies to an Arawak sub-group. Alegría (1948) proposes the use of an archaeological term, "Archaic."

8 Roth, 1887; Krieger, 1930; Rouse, 1948, pp. 522-539.

Vieques, an islet off the east coast of Puerto Rico, whence they conducted periodic raids on the Arawak of the larger islands, farther west.[9]

It is generally agreed that the Ciboney were the first to settle the West Indies, but whether they originally came from North America, as seems likely to us, is still a matter for dispute.[10] The Arawak arrived next, migrating from South America by way of the Lesser Antilles and driving the Ciboney back into the peripheral positions in which they were found by the Spaniards.[11] The Carib were the last to move in, again from the South American mainland. To judge from the Indian traditions, they took over the Lesser Antilles from the Arawak shortly before the arrival of Columbus.[12]

SPACE AND TIME SCALES

For the purpose of surveying the archaeology, it will be convenient to divide the Greater Antilles into a series of geographical units, which are represented by the vertical columns in the body of the accompanying chart (Fig. 2). From west to east, these include: (1) western Cuba, (2) central Cuba, (3) eastern Cuba, (4) Jamaica, (5) the Turks and Caicos Islands, (6) Haiti, (7) the Dominican Republic, (8) the western half of Puerto Rico, (9) eastern Puerto Rico, and (10) the Virgin Islands. The Bahamas colony, north of Cuba and northwest of the Turks and Caicos Islands, has been omitted because so little is known of its archaeology.

These particular units have been selected because they are the largest regions which appear to have been geographically homogeneous in culture during each successive period of prehistory. Nevertheless, they should not be considered culture areas, but, rather, segments thereof. In order to form areas, we have had to proceed period by period and to combine those units which are similar in culture. As will be shown, the combinations vary from period to period.

Seven arbitrary periods of time, comparable to the units of space, have been recognized in the Greater Antilles. They comprise the horizontal columns in Figure 2, where they are numbered I, IIa, IIb, IIIa, IIIb, IVa, and IVb. The

9 Ober, 1895; Joyce, 1916; Rouse, 1948, pp. 547-565; Taylor, 1949. The last disagrees with several of the above statements, particularly that the Carib relied so much on sea food.

10 Rouse, 1949. For the alternative theory, that the Ciboney migrated from South America, see Harrington (1921, vol. 2, pp. 424-426) and Herrera Fritot (1943, p. 268).

11 Osgood, 1942; Rouise, 1947b.

12 Gower, 1927; Lovén, 1935, pp. 51-53. Disagreeing with the latter's interpretation of the documentary evidence, Taylor (1949, pp. 381-382) doubts the recency of the Carib migration. However, it is substantiated for the areas under consideration here by the archaeological sequences discussed below.

evidence on which these temporal units are based has been presented elsewhere;[13] suffice it to say here that they are the result of stratigraphic analysis of refuse deposits, combined with cross-dating in terms of trade objects. Like the units of space, they are not entirely distinct in culture or style: in many cases it is necessary to combine two or more of them in order to arrive at cultural or stylistic periods, and the combinations vary from region to region.

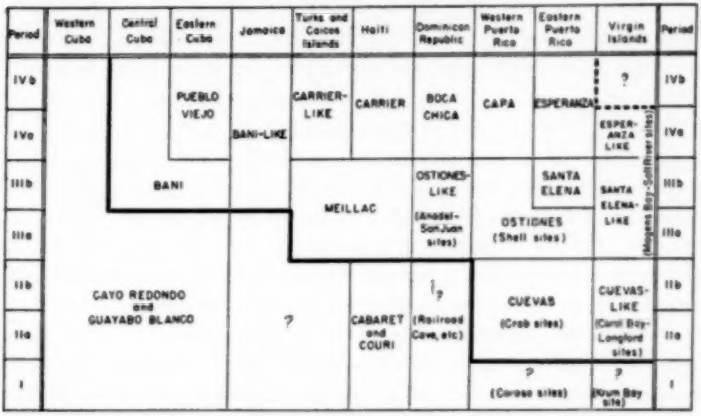

FIG. 2. Preceramic cultures and ceramic styles in the Greater Antilles.

No adequate way has yet been found to convert the units of time into the Christian calendar. Some indication of their duration, however, may be obtained from the following estimates, obtained by applying the rate of refuse accumulation in Puerto Rico during the historic period (IVb) to the average depth of the deposits on that island assigned to each of the prehistoric periods:[14]

Period IVb	1509-1584 AD
Period IVa	1437-1509 AD
Period IIIb	1317-1437 AD
Period IIIa	1193-1317 AD
Period IIb	1089-1193 AD
Period IIa	929-1089 AD
Period I	-929 AD

13 Rainey, 1940; Rouse, 1939, 1941, MSa.

14 Rouse, MSa. Since these calculations project the historic rate of accumulation back in time, they are probably more reliable for the later than for the earlier periods.

PHASES AND STYLES

The spatial and temporal units just outlined provide a scale upon which to lay out the archaeological remains of the Greater Antilles, as in Figure 2. The solid black line running diagonally across the middle of this chart marks the appearance of ceramics and agriculture; all the remains indicated below this line lack pottery and agricultural utensils, while those above the line have both.

The names below the solid black line refer to cultural phases, i.e. to complexes of type of artifacts which recur from site to site. The names above the line refer instead to ceramic styles, i.e. to similarly recurring complexes of pottery traits. This difference of treatment is a concession to the nature of the data: in the sites represented below the line, implements are practically our sole source of information, while in the sites above the line, over ninety-five percent of the artifacts found are ceramic. Since what is known of the burials, ceremonial structures, and stone, bone, and shell artifacts associated with each style indicates that they varied in correlation with the pottery,[15] it is thought that the shift from non-ceramic phases to ceramic styles will not affect our conclusions.

As is customary, we assume that all the phases below the solid black line are Ciboney, although this identification cannot be proven for lack of a detailed chronology of the non-ceramic phases and is rejected by some Cuban archaeologists.[16] Similarly, we consider all the styles above the line to be Arawak. Here we are on firmer ground, since stratigraphic studies in Puerto Rico indicate a continuity of stylistic and cultural developments through Periods II, III, and IV.[17]

It is not possible to correlate any of the remains so far discovered in the Greater Antilles with the third ethnic group, the Carib. To judge from the documentary evidence, Carib remains should eventually be found in the Virgin Islands and on the islets off the east coast of Puerto Rico, dating from Period IVb, at least. For the sake of completeness, therefore, we have added a dashed black line to the chart to mark off the section which is potentially Carib, even though this will not figure in the present discussion of the archaeological remains.

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15 Cf., for example, Rouse (1948, pp. 510-517), where the Arawak material is presented in terms of cultural phases rather than ceramic styles.

16 E.g., Pichardo Moya (1945), where it is assumed that the less advanced non-ceramic cultures, such as Guyabo Blanco, are pre-Ciboney.

17 Rouse, MSa. Rainey (1940) concluded that there was a break in the cultural sequence at the close of Period IIa, but this was subsequently filled by the discovery of remains dating from Period IIb.

CIBONEY PHASES

In order to examine the geographical variation in Ciboney culture, and thereby provide a basis for distinguishing areas within it, we shall discuss briefly each of the non-ceramic phases, beginning in the west and working eastward. Two phases are recognized in Cuba: Guayabo Blanco and Cayo Redondo.[18] As indicated in Figure 2, both are restricted to that island and apparently extend throughout it, but their relative chronological position is unknown.

The Guaybo Blanco phase is represented by small shell deposits, either in caves or in the open, especially in swamp areas. Its artifacts include gouges, plates, and cups, made from the outer whorl of the conch (*Strombus* sp.); deeper vessels, consisting of conch shells from which the columella and inner whorls have been removed; unworked or slightly retouched flakes of flint; and crude hammerstones.[19] Because of the absence of stone grinding, this phase has been termed "paleolithic,"[20] although the emphasis on shellwork is atypical of that stage of cultural development.

The Cayo Redondo sites are similar. Gouges, plates, and cups of shell are again found, but the deep shell vessel is missing. In addition to hammerstones and flint flakes, there are grinders, dishes, balls, and peg-shaped ceremonial objects known as *gladiolitos,* all of which have been ground of stone. These are said to give the phase a "mesolithic" cast.[21]

Two parallel phases of Ciboney culture have been distinguished in Haiti: Cabaret and Couri. These also appear to have an overlapping distribution (Fig. 2). It is not known whether they extend into the Dominican Republic.

The small Cabaret shell heaps have so far yielded only irregularly shaped, unworked or slightly retouched flakes of flint, comparable to those in Cuba, together with the cores from which these flakes were struck. The shell work so characteristic of Cuba is missing.[22]

The Couri shell deposits are the richest of all Ciboney sites. They are characterized by daggers, knives, and scrapers of flint, all made by finely rechipping the edges of large lamellar flakes, which contrast strongly with the smaller, more irregular Cabaret flakes. Ground-stone work is well developed; the types include dishes, single- and double-bitted axes, balls, beads, and *gladiolitos,* as well as

18 As already noted, some Cubans use other terms to refer to these phases (e.g., Cosculluela, 1946).

19 Cosculluela, 1946, pp. 11-12.

20 Ortiz, 1943, p. 137.

21 Osgood, 1942; Ortiz, 1943, p. 137.

22 Roumain, 1942; Bastien, 1944.

mortars and pestles, and milling and polishing stones. A chisel and an elaborately carved pendant are the only objects of shell yet found. It is noteworthy that the shell pendant and an ax, pestle, and two fragmentary dishes of stone are decorated with rectilinear incised designs, which foreshadow some of the designs of the Meillac and Baní ceramic styles discussed below.[23]

Non-ceramic strata have been found underlying ceramic refuse in two caves of eastern Santo Domingo[24] and one in Puerto Rico,[25] but their contents are not known. Puerto Rico and the Virgin Islands also contain a series of non-ceramic shell deposits, the cultural affiliations of which are uncertain. Excavation in four of the Puerto Rican middens, of which Coroso is typical, yielded no definitely worked artifacts but simply pieces of stone and shell which might have been used for grinding, hammering, and splitting other materials.[26] In the Virgin Islands, the only specimens found were rectangular stone adzes, red ocher, clam shell scrapers, and a few potsherds limited to the surface.[27]

CIBONEY PERIODS AND AREAS

It will be apparent that we know little of Ciboney culture except in Cuba and Haiti. Even in these two countries, it is not yet possible to establish a Ciboney chronology, although one is tempted to assume on typological grounds that the "palaeolithic" cultures in each country are earlier than the "mesolithic."

Cuba and Haiti may each be said to constitute a distinct culture area, in that all three of the geographic units into which we have divided the former island have yielded the same phases and these differ from the phases recognized in Haiti (Fig. 2). The Cuban area is characterized by an emphasis upon shell artifacts—particularly the gouge—while the Haitian area has a contrasting emphasis upon stone implements—particularly flakes and blades of flint. It is not known whether the Dominican Republic is linked with Haiti, but, to judge from the little available evidence, Puerto Rico and the Virgin Islands are culturally distinct.

Future work may change the above picture, but at present it must be concluded that the distribution of Ciboney remains corresponds to Fewkes' conception of island culture areas. While the various islands are linked together by negative traits, such as the absence of pottery, of agricultural implements, and of ceremo-

23 Rainey, 1941; Rouse, 1941, 1947a.
24 Gabb, 1881, pp. 146-147; Krieger, 1929, pp. 5-7.
25 Alegría, personal communication.
26 Rouse, MSa.
27 Hatt, 1924, p. 31.

nial structures, each differs in its more common positive traits and thereby constitutes a separate cultural unit.

ARAWAK STYLES

Periods IIa and IIb. In examining the Arawak styles, we shall proceed by groupings of periods and from east to west, in accordance with the time and direction in which the Arawak entered the Antilles. The only style so far defined for Periods IIa and IIb is the Cuevas, found in the "Crab culture" sites of Puerto Rico[28] (Fig. 2). This pottery is technologically the best in the Greater Antilles; its sherds are thinner and finer than most subsequent specimens, so that many ring when struck with metal. The vessels are highly variable in shape, encompassing almost all subsequent forms. Bowls in the shape of an inverted bell are typical; many are provided with a pair of plain, rectangular lugs or with vertical, D-shaped strap handles. Lugs, handles, or a well-defined section of the vessel surface, such as the lip or shoulder, are characteristically decorated with a red or, more rarely, black slip, or else these areas are set off by a high polish of the surface. White-painted designs, situated on the red-slipped areas, constitute a more obvious part of the decoration, but are relatively rare and are limited to Period IIa, the Cuevas pottery of Period IIb being decorated only with red or black paint.[29]

While a comprehensive sylistic classification has not yet been worked out for the islands east of Puerto Rico, it is apparent that the pottery of Hatt's[30] Coral Bay-Longford group of sites in the Virgin Islands closely parallels the Cuevas style (Fig. 2). Cuevas-like ceramic complexes have also been identified in the Lesser Antilles,[31] on Trinidad,[32] and at Barrancas, Venezuela, in the delta of the Orinoco River.[33] On the other hand, there is no such pottery in the rest of the Greater Antilles, west of Puerto Rico, so far as is known.

In all places where a chronology is available, the Cuevas and Cuevas-like complexes occur at the beginning of the ceramic sequence. Hence, they would seem to mark the progress of the original Arawak movement out from the Orinoco Valley through the Lesser Antilles into Puerto Rico. It is assumed that the Ciboney continued to occupy the rest of the Greater Antilles during Periods IIa and IIb (Fig. 2).

28 Rainey, 1940.
29 Rouse, MSa.
30 Hatt, 1924.
31 Josselin de Jong, 1947, pls. 8-11.
32 Rouse, 1947b, pl. G, 1-4.
33 Rouse, MSb.

Among the types of artifacts associated with Cuevas and Cuevas-like pottery are clay griddles, used for baking cassava; adzes, celts, and hammers of stone; and a variety of stone, bone, and shell ornaments. These have been found only in refuse, never in association with ball courts or the other ceremonial structures of the historic Indians. Representations of the *zemis,* which the later Indians worshipped, are also lacking, and it is therefore inferred that the Arawak came into the Antilles without the elaborate ceremonial complex which characterized them in the time of Columbus.[34]

Periods IIIa and IIIb. Four ceramic styles have so far been defined for Periods IIIa and IIIb: Ostiones and Santa Elena in Puerto Rico, Meillac in Haiti, and Baní in Cuba (Fig. 2). Ostiones potsherds are technologically almost as good as the previous Cuevas ceramics, and they retain many of the latter's distinctive traits, such as rectangular lugs and the painting or polishing of restricted surfaces. On the other hand, bowls are mainly straight-sided instead of bell-shaped; handles are looped over the rim rather than D-shaped; and, on the sherds of Period IIIb, the decoration is enriched by the addition of modeled head-lugs and curvilinear incised designs. It is difficult to distinguish the earliest specimens from Cuevas pottery, but as one proceeds upwards through the refuse of Periods IIIa and IIIb, the differences intensify, as if a gradual local development had taken place.[35]

Santa Elena sherds are coarser and thicker than the Ostiones specimens, painting is not so common, and incision is largely limited to simple, straight-line designs, the most typical of which is a series of vertical grooves on the outer surface of the vessel wall. The grooves are often bordered on one side by a vertical strip of clay, which appears to be a vestigial handle. Large, modeled head-lugs are also present. Santa Elena pottery resembles closely that of the Magens Bay-Salt River group of sites in the Virgin Islands, and there is reason to believe that it may have been introduced into Puerto Rico by people coming from that island group and replacing the local, Ostiones Indians on the eastern end of Puerto Rico (Fig. 2).[36]

In the Dominican Republic, to the west of Puerto Rico, the pottery of the Anadel and San Juan sites, which appear to date from Periods IIIa and IIIb, has close resemblance to the Ostiones ceramics of Puerto Rico.[37] Similar specimens occur as a minority ware in both Haiti[38] and Jamaica.[39] Since these specimens

34 Rouse, MSa.
35 Rouse, MSa.
36 Hatt, 1924; Rouse, MSa.
37 Krieger, 1929, pl. 25; 1930, pl. 31, top.
38 Rouse, 1939, pp. 94-95; 1941, pl. 25: 18-25.
39 Personal communication from Mrs Marian de Wolf.

are at the beginning of the ceramic sequence in Haiti and presumably also in the Dominican Republic, it is assumed that they mark the extension of the original Arawak migration westward from Puerto Rico at the expense of the Ciboney (Fig. 2).

Contrasting sharply with the Ostiones-like pottery just discussed is the bulk of the Period IIIa-IIIb ceramics of Haiti to which the name of Meillac has been given.[40] This material is rather poorly made and, in particular, lacks the smooth surfaces of Cuevas and Ostiones potsherds. The shapes are comparable, but decoration is characterized by fine-line incision and appliqué work, without the painting and modeling of Ostiones pottery. Hatched and cross-hatched designs incised on inturned shoulders are typical, as are face designs applied to cylindrical lugs. Similar pottery occurs in the Turks and Caicos Islands, perhaps indicating northward diffusion of the Meillac style from Haiti.[41]

Baní pottery, which was made in Cuba from Period IIIa or IIIb through IVb, is comparable to Meillac but has simpler decoration. During Period IIIb, before it became subject to influences from the styles of the subsequent periods, its designs consisted primarily of straight parallel incised lines and simple face lugs.[42] The contemporary pottery of Jamaica is very similar.[43]

Considered as a whole, the ceramics of Periods IIIa and IIIb divide into two groups: (1) the Ostiones, Santa Elena, and Ostiones-like pottery of the eastern and central islands, which appears to have developed locally from the earlier Cuevas ceramics; and (2) the Meillac, Baní, and Baní-like pottery in the center and the west, which resembles the first group in technology and shape but differs radically in decoration. The fact, noted above, that the hatched and cross-hatched designs of the second group are reminiscent of Ciboney art has led to the suggestion that the Arawak with pottery of group 1 obtained these designs from the Ciboney as they pushed westward into the latter's territory during Period IIIa.[44]

So far as is known, the pottery of Period IIIa has never been found in association with ceremonial structures or artifacts. With the pottery of Period IIIb in Puerto Rico, however, there are several ball courts,[45] and in both Puerto Rico and Haiti a few objects connected with the worship of *zemis*, such as stone amulets carved in the form of flexed human figures which, in historic times, the Indian

40 Rouse, 1939, pp. 42-43; 1941, pls. 6-23.
41 Booy, 1912, figs. 2, 13-15.
42 Rouse, 1942, p. 164.
43 Harrington, 1921, pp. 395-396; Booy, 1913, pls. 32, 34.
44 Rouse, 1949, p. 130.
45 Rouse, MSa.

warriors wore on their foreheads to ensure victory in battle.[46] It is therefore assumed that the worship of *zemis* had begun to develop during Period IIIb.

Periods IVa and IVb. Five new styles are known to have made their appearance during Periods IVa and IVb: Esperanza, Capá, Boca Chica, Carrier, and Pueblo Viejo (Fig. 2). The most elaborate of these is the Boca Chica, in the Dominican Republic.[47] Both bottles and bowls are included in this style, and the latter are commonly provided with an inturned shoulder, decorated with elaborate curvilinear incised designs. The outturned shoulder, which had been characteristic of the previous Cuevas and Ostiones styles, is now rare, as are also painting and loop handles. On the other hand, large modeled incised anthropomorphic head lugs become common, and similar designs are modeled on vessel walls.

Since the other new styles of this time are variations on the Boca Chica, they will not be described, except to say that they exhibit an increasing simplicity as one moves east and west from the home of the Boca Chica style in the Dominican Republic, as if they were derived from there. It is probable, indeed, that Pueblo Viejo, the Cuban style, is the result of a late migration from Haiti, which is mentioned in the sources.[48] The development of the two Puerto Rico variants—Capá and Esperanza—may have been touched off by a similar migration from the Dominican Republic, for we have found several intrusive Boca Chica sites in a part of Puerto Rico where the development is likely to have taken place.[49]

It is with the new ceramic styles of Periods IVa and IVb that most of the datable ball courts and other ceremonial structures and artifacts of the Antilles are associated. They appear in greatest variety in the Dominican Republic and western Puerto Rico, where they include ball courts, dance grounds, and single stone columns, often marked with petroglyphs; carvings of *zemis* in stone, bone, and shell; swallow sticks, used to induce vomiting; carved stools (these were a sign of rank in historic times); and such problematical artifacts as stone collars, elbow stones, and three-pointed stones.[50] The carvings are similar to the modeled head lugs of the various ceramic styles, and it is probable that both represent *zemis*; in fact, the historic sources indicate that the Arawak of Hispaniola portrayed *zemis* on their household utensils as well as on ceremonial objects.[51]

As in the case of the pottery, the ceremonial complex appears simpler the farther one moves east and west from its center in western Puerto Rico and the

46 Rouse, 1941, fig. 7; Lovén, 1935, p. 580.
47 Herrera Fritot and Youmans, 1946; Krieger, 1931.
48 Las Casas, 1875, vol. 3, p. 474.
49 Rouse, MSa.
50 Fewkes, 1907, pp. 53-58.
51 Rouse, 1939, pp. 58-59.

Dominican Republic.[52] Stone collars, elbow stones, and three-pointed stones, for example, are largely restricted to the center, while ball courts and the other ceremonial structures are limited to the area of distribution of the new ceramic styles of Periods IVa and IVb, none having been found in the peripheral regions where the Period IIIb styles survived.[53] On the other hand, swallow sticks, amulets, and wooden figures of *zemis* do extend into these peripheral regions.[54]

The picture which emerges from the foregoing synthesis is one of development of a new ceramic complex and of the cult of *zemis* in the central part of the Greater Antilles, viz., the Dominican Republic and western Puerto Rico, and of diffusion of both the ceramic complex and the cult east and west into the peripheral regions, with each becoming increasingly simple as it spread. It is significant that neither is found in the Lesser Antilles nor in western Cuba, adjacent to the South and North American mainlands respectively.[55] They appear to be local developments in the central islands.

ARAWAK PERIODS AND AREAS

We have seen that the Arawak passed through three periods of development after entering the Antilles: (1) An early period, corresponding to IIa and IIb on the general time scale, when these Indians first settled the Lesser Antilles, Virgin Islands, and Puerto Rico, bringing with them pottery and agricultural implements but not the ceremonial complex of historic times. (2) A middle period, IIIa and IIIb, when they spread into the rest of the Greater Antilles, driving the Ciboney back into the peripheral position in which Columbus found them. Contact with the Ciboney apparently produced some acculturation at this time, and the cult of *zemis* made its appearance in a simple form. (3) A late period, corresponding to IVa and IVb on the general scale, which was marked on the central islands by the development of a new ceramic complex and elaboration of the cult of *zemis*, both of which spread towards the peripheries.

Conditions during the first and third of these periods were not suitable for local variation. During the first period, the Arawak were newcomers and restricted to a relatively small part of the Greater Antilles, while during the third the spread

52 Hatt, 1924, pp. 40-41; Rouse, 1942, pp. 163-166.

53 Fewkes, 1922, p. 169; Rouse, 1948, p. 516.

54 E.g. Rouse, 1942, pl. 6; Joyce, 1916, pl. 16.

55 The above distinctions form the basis for an often-used, three-fold division of Insular Arawak culture: (1) Igneri, in the Lesser Antilles, where there are practically no traces of ceremonialism and the pottery resembles that of Barrancas on the mainland; (2) Taino, in the central islands, with its Boca Chica-like pottery and developed ceremonialism; and (3) sub-Taino, in the western islands, with Baní-like pottery and fewer traces of ceremonialism (cf. Lovén, 1935, p. vi ff; Alegría, 1948; Rouse, 1949, fig. 6).

of the new ceramic complex and of the cult of *zemis* to the peripheral regions apparently tended to obliterate local differences. In examining the areal distribution of Arawak culture, therefore, we must concentrate on the middle period, when variation was most evident.

As Figure 2 will indicate, the ceramic styles of the middle period (IIIa and IIIb) tend to cluster around the passages between the islands rather than the islands themselves. Thus, the Santa Elena pottery of eastern Puerto Rico, on the western side of the Vieques Sound, resembles closely that of the Magens Bay-Salt River group of sites in the Virgin Islands, east of Vieques Sound. The two are more similar to each other than either is to its neighboring style on the other side, and hence they may be said to define a single ceramic area.

Similarly, the Ostiones pottery of western Puerto Rico resembles most closely that of the Anadel sites in the Dominican Republic. These two regions therefore constitute a second area, centering around the Mona Passage, which lies between the two.

Finally, Haiti, Jamaica, Cuba, and the Turks and Caicos Islands, facing each other around the Windward Passage, all have the related Baní or Meillac styles or variations upon them. There is, therefore, reason to conclude that the land north, south, east, and west of the Windward Passage formed a third ceramic area.

The three ceramic areas, which have been named after the passages around which they center, are mapped in Figure 3. It will be seen that they contrast sharply with the Ciboney areas, defined above, which correspond with the island masses, as given in Figure 1.

CONCLUSIONS

This contrast between Ciboney and Arawak areas suggests that, whereas Ciboney culture may have been oriented towards the land, Arawak culture was instead oriented towards the sea. The traits of Ciboney culture seem to have spread by land and to have halted at the water barriers, whereas the Arawak traits apparently diffused mainly across the water passages, with the mass of each island forming a barrier against their further extension. While, therefore, the Ciboney may have been more adept at traveling by land, the Arawak were probably seafarers. It is even possible that the Ciboney obtained the greater part of their livelihood from the shore and the Arawak from the sea.

The Ciboney customs in this respect cannot be determined for lack of ethnographic information. On the other hand, the Spanish sources indicate clearly that the Arawak were seafarers and that they traded from island to island.[56] We have

56 Lovén, 1935, pp. 68-69.

seen, too, that local migrations from one island to another were not uncommon. While there is no evidence that the historic Arawak relied more on fishing than upon agriculture, it is significant that the prehistoric sites tend to be concentrated on the lee sides of the islands, which offer shelter for fishing.[57] Moreover, sites in the interior are definitely less common than those on the coast.[58] Our recent survey of Puerto Rico has indicated that the original, Period IIa Arawak settled

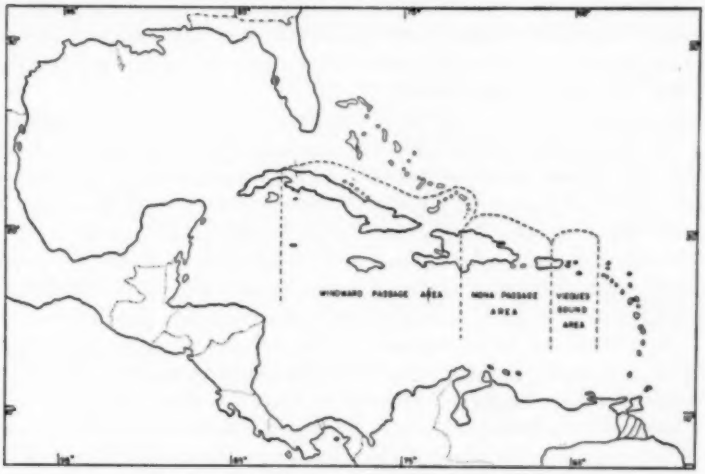

FIG. 3. Arawak culture areas in the Greater Antilles.

only the coast of that island and did not really begin to penetrate the interior until Period IIIb. Although the interior has several times the area of the coast, it was not until Period IVa, with the rise of ceremonialism, that the population of the former exceeded the latter.[59]

Despite these circumstances, it is not surprising that Fewkes and subsequent authors, including the writer, have overlooked the effects of Arawak orientation towards the sea. In part, we have probably been misled by the situation during Period IVa, when the Arawak had adapted to life in the interior of the islands and the previous areal differences were obscured by the spread of ceramic and ceremonial traits from the central, Mona Passage area (Fig. 3). We were probably also influenced by present conditions in the Greater Antilles. Except

57 Fewkes, 1914, p. 663.
58 Hostos, 1941, pp. 50-53.
59 Rouse, MSa.

for the division of Hispaniola between Haiti and the Dominican Republic, the distribution of contemporary civilization is entirely insular. Fishing is now relatively unimportant and, before the advent of the airplane, there was little inter-island communication. It would be a mistake, however, to assume that conditions like these necessarily held true for both the Ciboney and the Arawak.

The apparent orientation of the Ciboney towards the land has a bearing upon the problem of their origin. Such an orientation is more compatible with the short over-water passage from Florida (or Yucatan) to Cuba than with the long maritime voyage from Venezuela, and to this extent it favors the theory that the Ciboney came from North America.

On the other hand, the maritime orientation of the Arawak is more consistent with the theory that these Indians migrated from South America. It further implies that Arawak culture originated in a maritime or fluvial environment, and to this extent collaborates the recently discovered evidence, cited above, that the Arawak took off from the Orinoco basin when they settled the Antilles.

An important problem for future research is the extent to which the Arawak's maritime orientation enabled them to maintain contacts with the mainland during the middle and late periods of their habitation of the Antilles. We have seen that the cult of *zemis* and the accompanying styles probably developed locally in the Antilles. It is hardly likely, however, that this development was unaffected by influences from the mainland.

Certain theories have recently been advanced in connection with the Circum-Caribbean concept which would in effect derive both the cult of *zemis*[60] and the accompanying ceramic complex[61] from the South American mainland. These are in conflict with the archaeological evidence from the Greater Antilles, as interpreted above. Nevertheless, they do reflect certain general similarities between the islands and the mainland. In the writer's opinion, these resemblances are best interpreted as the result of secondary influences from the mainland, the exact nature of which remains to be determined.

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60 Steward, 1948, p. 14; 1949, map 22.
61 Willey, 1949, p. 195, map 3.

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SOME FIGURES OF SPEECH AND OBLIQUE REFERENCES IN AN AUSTRALIAN LANGUAGE (GUNWINGGU)

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WHILE THE CONTRAST of denotative and connotative aspects of words and phrases in a particular language is an end interesting in itself, it may well be that we can find significant cultural emphases in metaphorical and analogous extensions. This can be exemplified in the uses of Gunwinggu speech.

Gunwinggu is the language spoken by an Australian tribe[1] which is usually described by the same term as a matter of convenience. The correct tribal name, however, is *wiŋgu*, meaning "fresh water," or rather the plural form *wiŋguˈwiŋgu*; sometimes its members are described as *biriwiŋgu*, *biri-* being the third person plural prefix. This tribe, which is divided into a number of local groups with slightly differing dialects,[2] inhabits the west of Arnhem Land some miles inland from the coast. Today it is largely centered about Oenpelli Mission Station near the East Alligator River, approximately one hundred and fifty air miles from Darwin, in what was formerly Mangerdji territory.

Like every other language, Gunwinggu has its own peculiarities of arrangement and content, apart from the basic structure of formal grammar and syntax. Some of these are indicated in the present paper.

Isolated words are frequently omitted where it is felt that the context provides sufficient explanation. An adjective may be used without an accompanying noun, but with a class prefix to ensure clarity: e.g., *gungamag jimeraŋene*, "good (thing or place) made itself," means that a ceremony was held; *gunbwiiga ŋa-ben-won*, "different (thing) I-them-gave," means "I did something unexpected to them." Or a creature may be described by certain physical characteristics, instead of by

1 Field work among these people was carried out in 1947 under the auspices of the Department of Anthropology, University of Sydney, and the Australian National Research Council, and again in 1949-50 under the Department of Anthropology and the Research Committee of the University. The writing up of field material was made possible by grants from the Research Committee.

2 The dialect used in this paper is from Gurudjmug, the high stony region south of the source of Gumader Creek, said to be the home of the "true Gunwinggu." The phonetics follow the system of the International Phonetic Association, adapted for Australian use by Dr A. Capell: see A. Capell, *Methods and Materials for Recording Australian Languages* (Oceania, vol. 16, pp. 144-176, 1945).

Tribal distribution and social organization in western Arnhem Land are discussed in a forthcoming article for publication in the journal Oceania; and a Gunwinggu grammar and dictionary will be compiled later in the year.

its proper name: *nawu maĩ ŋalŋ-ji,* "that creature shell-with," the long-necked fresh water tortoise; *nawu maĩ bid-ŋalŋ-ji,* "that creature hand (i.e.claw)-nail-with," a goanna; *nawu gu(n)rɔ:re ga-wagge,* "that (creature) ground it-crawls," a snake; *nawu ganem-ji maĩ,* "that horn (lit., ear)-with creature," a buffalo.

Many words in Gunwinggu have both an ordinary and a specialized meaning, according to context. Among these are certain relationship terms, usually expressed in verbal form: e.g., *ŋaie ŋane-daŋen,* "I we-two-stand (together)," when used as a kinship term means "my sibling"; *ŋal-badjan,* "she-big" (*ŋal-* being the customary feminine prefix), is the everyday third person reference term for "mother." Similarly *ŋaie ŋane-ˈjɔ:,* "I we-two (excl.)-sleep (or camp)," and *ŋaie ŋane-ˈre,* "I we-two (excl.)-go (together)," are normally used in conversation to refer to a husband or wife.

Such forms, as a result of constant usage, are no longer consciously recognized as being either figurative or oblique. In this respect they differ from such expressions as *bene-wogde,* "they-two-talked (together)"; *bene-naˈ-rene,* "they-two-looked (at)-each other"; *bene-ne,* "they-two-sat (or stayed) (together)"; *bene-bega-rene,* "they-two-listened to (or felt)-each other." All these, in context, allude to sweetheart associations, and are freely employed in preference to more direct references. To make the meaning quite clear, however, the word *mararaidj,* "sweetheart," may be added.

In other cases, words which appear figurative to the outsider have no such connotation to the local Aborigines. *Gulba-gen,* "blood-relating to," is the ordinary term for a betrothed spouse (usually wife) who was formally promised before the afterbirth blood had issued from her mother. *Gundjen,* "tongue," may refer not only to the physical organ but to a language, and also (as in English) to a "tongue" of flame. *Djerˈ,* "dillybag" (carrying basket) may also mean "uterus."

Metaphors, whether or not consciously acknowledged as such, are much more common in Gunwinggu than are other figures of speech.

Similes are used occasionally: e.g., *gunwade bulebuˈlere, jiman ga-jime wa:g gunmud,* "stone very black, like it-is (lit., it-does or it-says) crow feathers," a "stone black like the feathers of a crow." And *jiman njaleˈ,* "like what"—similar to the colloquial English phrase "like anything"—is a convenient way of suggesting some remarkable phenomenon such as a very loud noise, a great quantity of food, or an extremely attractive man or woman.

Onomatapoeia is found, especially in the names of various animals or birds, and in describing certain cries or noises. And hyperbole is occasionally used for emphasis: *bi-bom, bi-bagbaggen,* "(he) her-hit, her-broke to pieces," meaning

"he hit her and hurt her badly"; *ŋa-djare-dowe*ŋ "I-desire-am ill (or die)," "I want (something) very much."

This paper, however, is concerned largely with what may be described as metaphorical idioms. Sometimes, as we have seen, the context alone determines whether a word or expression should be taken literally or figuratively, and sometimes continual use has dimmed the figurative value to such an extent that it is no longer explicitly acknowledged.

Thus *biri-gele-bug-men,* "they-fear-dry-became," means "they lost all their fear"; *ŋa-djod-men gu(n)bid nuje,* "I-grown-became (from) hand his," means "he reared me (or made me grow)"; *ŋunde-bolg-gaidju*ŋ, "you (acc.pl.)-road-follow," means "(we) copy you"; *ŋar-benbene-djen-bolg-gaidju*ŋ, "we-two (incl)-them-two (acc.)-tongue-road-follow," means "we both copy the speech of those two"; *ga-began gaindje ga-gaŋe-wul-ʻme,* "he-feels inside he-heart-hot-gets," means "he feels himself growing angry"; *benbene-wogge-jawane,* "them-two-with words-sought," means that someone (especially a woman) was crying for two people, relatives or children; *ŋan-bid-won,* "me-hand-gave," means "(he, etc.) copied me"; *mali ʻmalil ŋa-jime,* "shaking (as in certain rituals) I-speak," means "I just say (something) without meaning it"; *ji-benbene-geb-djined-we,* "you-(on) them-two-nose-mucus-throw," means "you should look after those two"; . . . *nawu benenunj-wejemalaiwe,* "that they-two-spittle-would throw (in the) morning," refers to cooked meat put aside to be eaten first thing on the following morning ("when we wake up we clear our throats and spit; then we eat"); and *biri-durlg-duggan,* "they-tree-wrapped up," means that the women in a certain ritual danced continually round and round a special post or tree.

Into the same category come *mandjole*ŋ, which in context means a "cooked" or circumcised penis (the class prefix *man-* agreeing with *manbed,* penis, and rendering the noun unnecessary); *na-dja:re* or *nawu dja:re,* "he far away," used in alluding to a dead man or woman; and *marunj,* literally meaning "plaited palm-basket," but used also in context to mean the internal organs of a corpse ("we can't say guts from a dead person").

In the same way, a number of Gunwinggu verbs have a relatively wide range of possible interpretations, according to their situational context. The following are some of the most important examples.

1.-ŋ*une*ŋ, "eat."

Apart from its literal sense, this verb most commonly relates to sexual intercourse, and such is virtually its only meaning in the reflexive or reciprocal forms; the Gunwinggu prefer it to the "correct" terms, which they usually avoid in polite speech. On the other hand, it is used figuratively in relation to death by

drowning: e.g., *gurula bi-geb-ŋuneŋ*, "sea him-nose (or forehead)-ate," "the sea drowned him." Similarly, to say that the Rainbow Snake swallowed someone is equivalent to declaring that he was drowned.

A number of other expressions also stem from the literal meaning: e.g., *dja med, bal-dalg-ŋu muŋoi̯*, "but wait, (he) (will) grass-eat all the time" (*bal-* signifying movement in space or time), being a threat to the effect that "presently he will die." In another popular phrase, wishing to "eat someone's nose (or forehead)" is tantamount to a declaration of affection or gratitude: *ŋa-geb-ŋuneŋ ge!* "I-nose-eat yours!" is a term of endearment to a lover or close relative, or merely a casual expression of thanks for a favor.

In addition, a parallel to English colloquial usage is found in such idioms as *njale̯ mag ŋun-ŋuneŋ?* "what then you (acc.)-ate?" or "what happened to you?" and *njale̯ ŋure-wam muŋoi̯ ŋure-ŋuneŋ?* "what you (pl.)-went long time you (pl.)-ate?" or "you went away for a long time, what were you doing?"

2.*-baijeŋ*, "bite."

Here the figurative meaning often follows clearly from the literal meaning. Thus *mangole bi-baijeŋ!* "spear him-bit!" refers to a man's being speared where the speaker does not want to use the ordinary word for this; and *ŋogo ben-wog-baijeŋ bedbere manbu gundaŋbun*, "at last (he) them-word(s)-bit theirs that Dangbun (language)," means that "at last he was able to speak their Dangbun language."

In other expressions, however, the connection is less easy to trace: e.g., *ben-bid-baijeŋ bedbere*, "(he) them-hand (or finger)-bit theirs," meaning, "he died."

3.*djobme* (intrans.), *djobge* (trans.), "cut."

Here, too, an extension of the literal meaning accounts for a number of associated forms. This verb frequently has the sense of "stop" or "halt," or (as in English) "cut short": eg., *ŋoleg-djobmeŋ*, "(he) breath-stopped," or "he died"; *ji-wog-djobge!* "you-word-stop!" meaning "you keep quiet!" It also refers, in much the same way as in English, to the limit or extent of something, especially water: e.g., *bi-gom-djobge*, "him-throat-cut," "(water) came right up to his throat"; and *wade djobge*, "rock (it) cut," meaning that water came up to a point on the rock. In another expression, *ga-bi-gug-djobdjobge*, "he-him-body-cut (and) cut," the figurative meaning is "he swears at (or abuses) him strongly."

There are also other less clearly related turns of phrase: *gabiri-bodme-djobme*, "they-back(s)-cut," or "they laugh heartily" (i.e., they laugh so much that they bend forward as if to break their backs); *biri-m-goid-djobme-wam*, "they-hither-head-cut-came," meaning "they were eager to come," *goid-djobme* ("head-cut") being often translated as "sulky" on account of some person, thing or place; or

biri-rag-djobge-ren, "they-thigh-cut-themselves (or each other)," meaning, "they squatted together (about one fire)."

4.*boledme* (intrans.), *boledge* (trans.), "turn."

This verb also has the meaning of "change": e.g., *gug-boledge-ren nuje,* "body-changed-itself his," "he turned into something else" (such as an animal or reptile, or a drift of smoke). The less strictly literal interpretations of the verb are quite straightforward: e.g., *nuŋan-wale boledge-ren,* "himself-in turn (he) turned-himself," meaning "he retaliated"; and *biri-bid-boledme,* "they-hand-turned," or "they (deliberately) did something unexpected."

5.*wolggaŋ,* "hide."

In the figurative sense, this is usually associated with no. 4 above. To "hide one's hand," for instance, is to conceal one's intentions and (usually) to make plans for revenge: e.g., *ŋa-mane-bid-wolgga-ren,* "I-from-her-hand-hide-myself," and so on.

Apart from these ordinary forms, one of the clearest examples of conscious metaphor is found in relation to menstruation, which is rarely referred to as bluntly as in most areas of Aboriginal Australia. Thus *gundurlg bi-reŋe-djudme,* "stick her-foot-pierced," and *madjawar bi-reŋe-dulubom,* "bamboo spear her-foot-struck," are the two most customary methods of alluding to the first menstrual period. For subsequent occasions, as well as for the first, the most usual is *gu(n)bodme ga-rergaŋ,* "back she-sits down" (i. e. with pain in her back), or *manbu ŋadman gadbere jimeran bu gan-gelg-won gadbere,* "that (thing) ourselves for us (or ours) made itself when us-weak-gives for us," "that thing which makes us weak."

From the few examples set out here, it is evident that Gunwinggu speech is not lacking in metaphorical idiom and indirect references. That is not to say that these people do not equally favor a direct approach when the occasion demands it. They can be quite outspoken, not merely in abuse or "swearing" during quarrels, but in everyday conversations as well.

There is, perhaps, some inconsistency in their attitude from an outsider's point of view. While they consider it polite to use the verb *ŋuneŋ,* "eat," in alluding to sexual relations, reserving the "correct" terms chiefly for abuse, for erotic singing, or for describing the activities of dogs (with a slightly derogatory implication), they nevertheless use this substitute word freely and without reserve; and they do not hesitate to use direct terms for male and female sexual organs. On the other hand, they express distaste at the "crudeness" of the

eastern Arnhem Landers in making, for instance, direct reference to menstrual blood.

The difference, of course, is primarily one of cultural emphasis. In the great majority of figurative expressions, as indicated above, no emotional values are consciously present. But even in these cases the very grouping of words and ideas into similar and dissimilar categories, as an unconscious expression of accepted attitudes, is culturally significant. In regard to others, however, we can observe how some of the basic values and orientations of a culture are manifested in the language which serves not only to transmit but also to reinforce them.

There are certain things which "one doesn't say," or at least not in so many words. Some situations, forms of human behavior, or actions, must not be mentioned directly except under the stress of some powerful emotion; to do so would represent a breach of good taste which would lead at least to a heated argument, if not to a serious fight.

Nevertheless, the Gunwinggu are notoriously frank in relation to certain topics which we in our society surround with strong prohibitions and evasions; and they cannot understand the reticence of Europeans in what they themselves feel to be essential elements of everyday life. In one form of erotic singing, for example, the songman spares no physical or emotional details in an effort to add variety to what would otherwise be rather wearisome reiteration; and audiences greet with applause any "new" twist to the description of a situation which is, basically, susceptible of little alteration. The majority of Europeans, with a different emotional approach, and different ideas of what should be said in public and what (in polite speech) should remain at best a matter of inference only, would probably find this bluntness distasteful or even "disgusting."

Symbolism in speech, then, is of interest to the anthropologist not only for its literary qualities. It serves also as an important medium for expressing culturally determined values and attitudes, both traditional and modern; and the slight individual variations found between one speaker and another are much less marked here than in regard to literal or non-symbolic forms.

This paper records, in a very brief and preliminary way, without cross-cultural references and comparisons, some of the figurative expressions in everyday use at present among the Gunwinggu-speaking people of western Arnhem Land, in the Northern Territory of Australia.

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THE EARLY DIFFUSION OF THE POTATO AMONG THE COAST SALISH[1]

WAYNE SUTTLES

THE FIRST EUROPEANS to observe the Coast Salish peoples of the Strait of Juan de Fuca, Puget Sound, and Georgia Strait were the Spanish and British explorers of 1790-91. Their accounts describe these tribes as hunting and fishing peoples without cultivation of the soil.[2] Fifty years later, travelers, traders, and the like report Indian women of nearly every tribe in this area cultivating patches of potatoes with digging-sticks. At this time, in the 1840's, Whites were living only at a few Hudson's Bay Company posts. Settlers began coming into this area in the 1850's, but the potato seems to have arrived before them. Living informants tell how their people got potatoes from other Indians. Settlement eventually destroyed the old potato patches or Whites taught the native men farming on reservations.

The cultivation of potatoes during this period between first contact and settlement suggests three problems: First, where and how did the Coast Salish get their potatoes? Second, what is the relation of the sort of cultivation they practised to pre-contact practices? Third, what bearing does this have on the relation between food-gathering and cultivation in general?

I. THE SOURCE

Historic Evidence

The earliest possible sources of potatoes on the Northwest Coast are the Russian settlements in Alaska and the Spanish settlements at Nootka Sound and Neah Bay.

Although the Russians arrived early, their first colonization was at Kodiak in 1783. Here and at colonies established later to the east agriculture was tried but apparently without too much succees.[3] Diffusion down the coast may have

1 A condensed version of this paper was read before the Northwest Anthropological Conference, May 5, 1950. The material from field notes was obtained while doing work sponsored by the University of Washington and by the Viking Fund.

2 I have found no reference to potatoes or cultivation in the accounts of Espinosa y Tello (Wagner, 1933), Vancouver (Meany, 1942), or Menzies (Newcombe, 1923) where they refer to exploration of the Strait of Juan de Fuca, Puget Sound, or Georgia Strait, nor in Fraser's account of his descent of the Fraser River in 1808 (Masson, 1889).

3 Bancroft says that Shelikof, the founder of the colony on Kodiak, planted vegetables but

occurred, but evidence I will give later suggests diffusion in the opposite direction.

The Spanish put in gardens at Nootka, and one account mentions a number of plants, including potatoes, seen growing there in 1791.[4] But the Spanish did not stay long, and Jewitt in 1803 found a few European plants seeding themselves on the site of the Spanish establishment. He mentions no potatoes among them.[5] I think Nootka Sound may be ruled out as a possible source of potatoes for the Coast Salish. There was also a garden at Neah Bay in 1792, but the settlement was abandoned after less than a year.[6]

Another possibility is that one or another of the earlier traders planted potatoes simply to create good will among the natives. A Captain Douglas planted some beans for the Haida in 1798 as such a good will gesture.[7]

However, the most likely source of potatoes is, of course, the fur companies. The Pacific Fur Company planted twelve potatoes near Astoria in 1811 and three years later harvested fifty bushels of them.[8] When the Hudson's Bay Company took over Astoria, they continued to farm. Soon after posts were established on the Pacific slope, the Hudson's Bay Company was faced with the need for a supply of agricultural products not only for its own use but to fulfill a contract with the Russians as well.[9] Therefore the Hudson's Bay Company established farms in connection with its forts. Gardens were planted at Fort Vancouver in 1825,[10] Fort Colville in 1826,[11] Fort Langley in 1827,[12] and at Fort Nisqually in 1833.[13] At each of these posts company employees were married to native

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could not persuade the Kaniagmiut even to eat them, let alone cultivate them (Bancroft, 1886, p. 227n.). However, he says, "Khlebnikov . . . claims that mealy and good-flavored potatoes were raised at Sitka on ground manured with sea-weed, the crop being in some places 12 or 14 to one, but there is no confirmation of this statement." Furthermore, Wrangell states that more than a ton of potatoes were raised in 1831 (Bancroft, 1886, p. 687n.).

Dr T. C. Frye has told me that in 1913 he observed the Indians of New Metlakatla growing potatoes, using *Nereocystis* kelp as fertilizer. He believes this use of kelp was unknown to Americans at that time. It seems possible, then, that the planting of potatoes and the use of kelp as fertilizer by Indians go back to the time of Russian occupation.

4 Wagner, 1933, p. 162.

5 Jewitt, 1815, p. 51. Sproat (1868, p. 53) mentions potatoes as something obtained within the preceding twenty years.

6 Wagner, 1933, p. 62. The account mentions only green vegetables.

7 Dawson, 1880, pp. 159B-160B.

8 Barry, 1929b, p. 161. According to Barry the first Whites to plant in the Oregon country were the crew of the *Ruby*, near Ilwaco, in 1795. Barry (1929b) and Scott (1917) give considerable information on early White farming, especially in Oregon.

9 Bancroft, 1887, pp. 61-62, 80-81.

10 Scott, 1917, p. 56.

11 Bancroft, 1886, p. 472.

12 McKelvie, 1947, p. 46, p. 48.

13 Bagley, 1915, p. 187.

women, and it is likely that through them cultivation was spread among the natives. The Company may have encouraged the natives to take up cultivation in order to have another source of supply in emergencies.

Potatoes may have come up the coast from the mouth of the Columbia to the Strait, but the Hudson's Bay Company's Fort Langley, founded on the Fraser in 1827, looks like the most probable source of potatoes for the Strait and northern Sound peoples. The testimony of a company officer, the accounts of informants, and linguistic evidence support this conclusion.

James Douglas, in a letter to London in October 1839, wrote:

> I may be permitted to mention . . . as a matter to interest the friends of our native population, and all who desire to trace the first dawn and early progress of civilization, that the Cowegians around Fort Langley, influenced by the counsel and example of the fort, are beginning to cultivate the soil, many of them having with great perseverance and industry cleared patches of forest land of sufficient extent to plant, each ten bushels of potatoes; the same spirit of enterprise extends, though less generally, to the Gulf of Georgia and de Fuca's straits, where the very novel sight of flourishing fields of potatoes satisfies the missionary visitors that the Honourable Company neither oppose, nor feel indifferent to, the march of improvement.[14]

Douglas was, of course, attempting to refute accusations that the Hudson's Bay Company was determined to keep the country in a state of savagery, so he may have exaggerated the role of the company in the spread of cultivation. However, Fort Langley looks like the best possibility for the northern Sound and Strait.

The next earliest report of potatoes grown in this area I have discovered is that of Father Blanchet, who visited the Skagit in 1840.[15] In 1841 Wilkes found them grown also by the Port Discovery Klallam and the people of Port Townsend (possibly Chemakum). The same year some Indians at Point Roberts offered some to George Simpson. In 1842, while reconnoitering the site of the future Victoria, Douglas found the Songish growing potatoes, and the next year he reported them for the Dungeness Klallam. In 1843 Father Demers was given potatoes by the Snohomish.

During the 1850's potatoes were reported for the Duwamish, Skagit, Makah,

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14 *Fort Langley Correspondence*, p. 190; also quoted in McKelvie, 1947, p. 57. "Cowegian" is an older spelling of "Cowichan." Actually the name Cowichan belongs properly only to the villages on the Cowichan River, Vancouver Island, but it has been used by several writers as a general term for the Halkomelem-speaking peoples. Here Douglas simply meant Lower Fraser tribes.

15 This and the references immediately following are included in the Appendix.

Cowichan, Nanaimo, Samish, Nuwhaha, and Semiahmoo. And I am sure I have not exhausted the literature.

Fitzhugh's description of the Nuwhaha (whom he calls "Neukwers") and other interior groups of northern Puget Sound deserves to be quoted in full because of the cultural and historic context in which potatoes appear. This was written in 1857.

> They have very little intercourse with the Saltchuck Indians, and never had seen a white man in 1852, when the first settlers came to this bay [Bellingham Bay], and did not even then come down for a year after.
>
> They dress in skins and blankets, made of dogs' hair and feathers, of their own manufacture. They have had no muskets until the last three years. They cultivate small patches of potatoes but subsist principally on elk, deer, fish, and berries.[16]

From this one may infer that the Nuwhaha had potatoes before they had any direct contact with Whites.

Outside the Sound and Straits area the situation was the same. Potatoes were raised among the Haida by 1841, the Lower Thompson by 1847, the Kalispel by 1841, the Copalis and the Quinault by 1854, and the Umpqua by as early as 1834.

It is possible, of course, that the word "potato" does not always refer to the white potato, *Solanum tuberosum*. One, perhaps several, native plants have been called "Indian potato." The plant most frequently so called was *Sagittaria latifolia*, called "arrowhead" in English, *wapato* in Chinook Jargon. The two plants, *Sagittaria* and *Solanum*, are not closely related, look quite unlike, and have quite different habits: *Sagittaria* has leaves like a calla lily and grows under water; it was gathered by wading and treading the roots loose. But apparently the two taste alike, so native names for *Sagittaria* came to be used by Indians for the white potato. But the Whites usually used the name "wapato" to designate *Sagittaria*, and when they wrote of large quantities of potatoes of fine quality being raised on the natural clearings called "prairies," it is hard to believe they could have been writing of *Sagittaria*. Several native plants grew on the prairies, the most important being camas. But the early Whites also knew camas and called it that.

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16 Fitzhugh, 1858, p. 326. The Nuwhaha lived in the Samish valley and have sometimes been called "Upper Samish." This is a confusing term, however, since they and the Samish were different in orientation and in speech. The Nuwhaha were an inland people who spoke Puget Sound Salish; the Samish were a salt-water people who spoke lək'ᵒŋe'nəŋ, the language I have called here "Straits Salish" from its distribution on both sides of the Strait of Juan de Fuca. The term "Nuwhaha" I have taken from the native name which appeared in the Point Elliot Treaty of 1885, "Noo-wha-ha."

Old Indian informants describe the potatoes their grandparents raised as white potatoes and clearly distinguish between them and anything that might be called "Indian potatoes." It seems most probable that although there may have been an occasional confusion with a native plant, when early White accounts say "potatoes" they nearly always mean *Solanum tuberosum*.

Ethnographic Evidence

I first became aware of the early occurrence of potatoes among the Coast Salish while working on the Swinomish Reservation. Here three informants, two Samish and one Swinomish, told me substantially the same story. Potatoes came before the Whites were here. According to one account a man went to New Westminster and brought one sack of them to Swinomish. He gave the informant's grandmother about a dozen, told her to cut them into pieces, one eye to a piece, and plant them in the spring. She planted them, using a digging-stick such as women used for camas bulbs or clams. According to another account, potatoes were brought by Seechelt who came in big canoes and gave one bucket to each person. The informant's grandmother got one bucket. The Skagit chief ni·'X'əm came and got some to take back to Whidbey Island.

It was while he was on his way to meet a chief Netlam on Whidbey that Father Blanchet stumbled onto a Skagit potato patch. This was in 1840. When Wilkes came by the following year he found the Skagit growing potatoes and beans, and reported "the priests are inducing the Indians to cultivate the soil." Since Blanchet was the first priest to visit the Skagit and he found them growing potatoes already, he cannot be responsible for them, though he may have introduced the beans.

Informants from the Lummi, Saanich, and other groups also report potatoes being grown in their grandparents' time. One variety, possibly not the first to arrived, was called "ship potato" presumably from its source. The sources of the other varieties were unknown, but a Semiahmoo said that the variety believed to be the first grown used to be obtained from the Snokomish at Boundary Bay.[17]

Marian Smith states that the Nooksack were a center for the early diffusion of potatoes but says nothing as to time, source, or direction of diffusion.[18] It seems quite possible that the Nuwhaha and other interior groups to their east and south got potatoes from the Nooksack, who are of course also interior people. But my Samish and Swinomish accounts suggest that salt-water people got them

17 Appendix 2 gives the data I have obtained on potato varieties.

18 Smith, 1949, p. 2. The statement appears in the article by Dr Trinita Rivera, but was apparently written by Dr Smith.

from other salt-water people. It may be that there were two lines of transmission south, one on the salt water and one in the interior.

Linguistic Evidence

Four Coast Salish languages are spoken in the area I am dealing with: the Vancouver Island tribes from Malahat to Qualicum and the Lower Fraser tribes speak a language they call Halkomelem; the southeast Vancouver Islands tribes, the Klallam, and the Semiahmoo, Lummi, and Samish speak Straits Salish; the Swinomish and Nuwhaha and tribes south to Olympia speak Puget Sound Salish; while the Nooksack speak an isolated Salish language. As I have already indicated, over a fairly wide area the native name for the *Sagittaria* came to be used for the introduced white potato. The Chinook Jargon *wapato,* the Puget Sound Salish spiəqoʻlʼc, and the Straits, Halkomelem, and Nooksack skäʻus, all came to mean the white potato. Perhaps the transfer was made first in Chinook Jargon on the Columbia. Then when the word *wapato* was brought north as the name for both the native *Sagittaria* and the new plant, this precipitated the same transfer in the Salish languages. Or it may be that the two are so alike in flavor that the transfer of names suggests itself to everyone meeting the potato for the first time. Since Lummi and Nooksack informants knew *Sagittaria* as having been obtained on the Lower Fraser or in Duwamish country, it may be that the name skäʻus is originally Halkomelem only.[19]

The word skäʻus evidently originally meant the tuber of the *Sagittaria*; the whole plant, following the usual Salish practice, was called by a derivative word skawiʻsəlʼɬ. But when the white potato was introduced and it became skäʻus, *Sagittaria* retained the name skawiʻsəlʼɬ only, and while some informants point out what has happened, others are apparently unaware that the two words are cognates. The common root is *kaʻuiṣ. (The initial s is a frequent Salish prefix; the terminal ṣ represents a sound which is probably distinct from s and sometimes appears as a *θ*.) This root is probably an old one in the Halkomelem and possibly Straits and Nooksack languages. But it has spread in the word for the white potato beyond its original range where it first meant *Sagittaria* tuber.

While the Halkomelem and the northern Straits dialects have skäʻus, for the southern Straits dialects, Klallam and Samish, I recorded skaʻuc and skaʻwəc respectively—the difference is probably not phonemic. (The correspondence of s

19 McKelvie, apparently using McMillan's journal for the fall of 1827, says that at that time as many as 5,000 Indians, on the Lower Fraser for salmon, assembled at Pitt River at the end of salmon season "to dig 'skous,' a tuber that grew in pools and swamps, and which was considered a delicacy" (McKelvie, 1947, p. 33).

of the northern dialects to c in the southern is usual.) Swinomish and Nuwhaha, the two northernmost Puget Sound dialects, have ska'uc for the potato. In other Puget Sound dialects to the south the potato is spiəqol'c, the old word for *Sagittaria*. Swan gives the Makah word for potato as "kau-its,"[20] obviously the same word without the s- prefix and with the southern Straits final c. Dr Morris Swadesh gave me the Alberni Nootka word (if my memory is right) as ska'wəs, with the s- prefix and with the northern final s. It is possible that the Swinomish and Nuwhaha words are old borrowings for *Sagittaria*, but the Makah and Alberni words must have arrived with the potato. And the fact that the Makah and Alberni words are unlike indicates separate borrowings from separate Salish dialects. What is more, Dawson recorded the Haida word for potato as "skow-shīt,"[21] which looks as if it may be the word skā'us plus some Haida suffix.

These terms for potatoes (with the Haida doubtful) then seem to go back to a Halkomelem or possibly specifically Lower Fraser word for the *Sagittaria*. This suggests that the potato itself was carried by Indians from the Lower Fraser.

It seems to me that a similar situation might be discovered elsewhere—lines of diffusion leading out from each early trading post, traceable by the terms used.[22] But what is to me more significant than *where* the Coast Salish got their potatoes is *how*. The inescapable conclusion is that although in some places they got them directly from Whites, elsewhere they must have got them indirectly and with only the barest instructions as to their cultivation.

II. THE POSITION OF THE POTATO IN THE NATIVE CULTURE

To answer the question on the relation of potato cultivation to native cultures, I shall summarize potato cultivation from early accounts and field notes, then try to show what was involved in the addition of potato cultivation to the native culture.

Both the early accounts and the word of informants indicate that the labor of planting and harvesting was done primarily by women, using the traditional digging-stick that women used for roots and clams. The Saanich informant,

20 Swan, 1868, p. 101.

21 Dawson, 1880, p. 113B.

22 Another example: Simpson saw potatoes on the Pend d'Oreille River in 1841, learned the Indians had got "the seed and implements" from Fort Colville (Simpson, 1847, p. 134), and gives the native word *"patac"* (presumably for potato, p. 146). Dr W. W. Elmendorf was told by a Columbia that the Columbia and the Wenatchee raised potatoes, called lāptā'k, before White settlement. In this instance the planting was done by men who broke the soil with large (six feet or more long) digging-sticks. Both sexes harvested.

however, said that the chief ləsčeʼ́m at East Saanich owned about ten slaves of both sexes and that they cultivated potatoes for him. They turned the soil with digging-sticks and broke up the clods with their hands. In both the Swinomish and Samish informants' accounts potatoes were brought by men but given to women to raise. A Semiahmoo said his grandmother raised them, and Swan speaks of Makah women raising them. I am not sure how to interpret Gibbs' statement about the Duwamish: "Each head of a family plants his own, the quantity being regulated by the number of his women."[23]

Early accounts usually describe the potato patches as small. So do the accounts of the informants: even the ten Saanich slaves cultivated altogether only about an acre.

Potato patches were usually on the natural clearings called "prairies" that used to be found on some of the islands and on some of the upper river valleys. The Samish first planted on a camas-prairie on Fidalgo Bay which was an abandoned village site to which women had habitually come for camas before they got potatoes. Blanchet, Gibbs, and Wilkes wrote of Skagit patches on prairies on Whidbey Island.[24]

Simmons wrote in 1858 that the interior tribes raised more potatoes than the salt-water tribes.[25] This may be simply because they had more prairies.

Two exceptions to the usual description of fields as small are those of the Cowichan and the Duwamish. The Cowichan fields which Douglas saw in 1854 were on "alluvial islands near the mouth of the river." He described them as "large and well-kept."[26]

Gibbs says that the Duwamish and some others had about thirty acres under cultivation at the outlet of Lake Washington. In 1854 they raised about 3,000 bushels, an average of one hundred bushels to the acre. "Of these," he says, "they sold a part, reserving the rest for their own consumption." He does not say to whom they sold, but I take it sale was to Whites. He says, "Their potato patches are very fine, although they have used the same seed on the same ground for a succession of years."[27] Elsewhere, referring to Puget Sound tribes in general, Gibbs writes, "Inclosures for garden patches were sometimes made by banking up around them with refuse thrown out in cleaning the ground, which, after a long while, came to resemble a low wall. . . ."[28]

23 Gibbs, 1855, p. 432.
24 See Appendix 1 for references.
25 Simmons, 1858, p. 225.
26 Douglas, 1854, p. 246.
27 Gibbs, 1855, p. 432.
28 Gibbs, 1877, p. 223.

These statements, incidentally, suggest practices of long standing.

In regard to cooking methods, Lummi and Saanich informants say that potatoes were at first only roasted in the ashes and eaten with dried fish. One added that they were boiled only after iron kettles were acquired. Swan says that the Makah steamed their potatoes in wooden troughs by putting hot rocks in with them, sprinkling, and covering them over with mats. Describing meals, he says, "The potatoes are served first, and are eaten with oil, the custom being to peel off the skins with the fingers, dip the potato in oil and bite off a piece, repeating the process at each mouthful."[29]

It is difficult to determine what role potatoes played in the native diet. Marian Smith says, "The potato was so quickly and readily accepted by all the groups of the area, and soon formed such an important item of diet, that one suspects the Indians had previously felt a certain deficiency in starch foods."[30] But Swan, writing of the Makah, says, "Potatoes are esteemed by them rather as a luxury than as ordinary food. . . ."[31]

The truth may be that potatoes were accepted quickly and readily because in part they had a cash value at the trading posts, and this in turn gave them a potential value and thus a superior status among roots even at some distance from the posts.

During the period of settlement White needs may have been a factor in increasing native production. Buying potatoes from Indians seems to have been a common practice among settlers.[32]

On the other hand, White settlement eventually had a bad effect on native potato-raising. Without clear title to their lands, the Indians could not hold patches of prairie that they visited only for a few weeks or months of the year. Simmons in 1858 mentions the Whites' practice of taking over the good potato prairies.[33] The spot on Fidalgo Bay where the Samish first planted potatoes was, it so happens, the spot where the first settler in that area picked to settle. Even where colonists did not settle on the inviting prairies, they often had loose grazing livestock which soon found the prairies and destroyed the plants. Gibbs in 1855 speaks of the cattle and hogs of settlers on Whidbey Island destroying not only

29 Swan, 1868, p. 26.

30 Smith, 1949, p. 21. See Note 16.

31 Swan, 1868, p. 33.

32 In 1852 two traders, Cooper and Blankhorn, bought potatoes and cranberries from the Katsey to sell in San Francisco (Nelson, 1927, p. 19).

33 Simmons, 1858, p. 235; and better, Jones in Alvord, 1857, pp. 9-10.

the Skagits' potatoes but the native camas as well.[34] Thus it seems likely that the Indians were raising more potatoes before White settlement than after.

III. POSSIBLE SIGNIFICANCE

The change from a food-gathering to an agricultural mode of life is usually represented as a highly significant one. It *is*, of course, in its ultimate consequences. But here such a change was taking place almost imperceptibly. The institutions and techniques of the native food-gathering societies were organized in such a way that the cultivation of potatoes was able to enter without any need for a major economic readjustment.

Two things made this possible: first, the existence of a root-gathering tradition; and second, a sedentary life.

A root-gathering tradition implies a division of labor, with some members of the group assigned root-gathering as their regular task. It implies tools and digging techniques. And it implies methods of preparation and possibly of storage. Coast Salish culture assigned to men the task of providing meat and fish and to women the task of providing vegetable food and shellfish. Women gathered, among other things, roots, which they dug with digging-sticks, stored in baskets or bags, steamed with hot rocks under mats, served with fish and oil.

A sedentary life implies opportunities for the revisiting of the same root patches, the tending of the plants, and the development of concepts of ownership. The Coast Salish peoples maintained permanent dwellings in which extended families lived during half the year and which served as bases for food-gathering expeditions the other half. Their habitat was rich enough in natural foods and their preserving techniques were good enough to allow some members of the group to stay at home at any time if need be. And their means of transportation was fast enough that few expeditions took them more than a day's journey from home base. Thus women were able to return to the same root-patches, year after year, not only at digging-time but at other times as well if they chose to. Concepts of ownership and simple tending of the plants could exist and did.

Ownership of patches may not be necessary to cultivation but caring for plants usually is, and the two—ownership and plant-tending—seem to be related. Among the Straits people, whose territory extended into the San Juan and Gulf islands, families owned not only camas beds but clam beds as well. In both cases they took some care of their property. In camas beds they kept the ground loosened up so as to make digging easier, and one informant spoke of burning off the bed after digging. In clam beds they sometimes took out the bigger rocks; one old

34 Gibbs, 1855, p. 433.

Samish woman supervised the digging in her horse-clam bed, not allowing anyone to leave broken shells in the sand. Such beds and patches were the property of upper-class families. Ownership was through inheritance, but I suspect that an investment of labor helped maintain it.

Into this natural background came the cultivation of potatoes. The only new elements that were added were the plant itself and the planting of it. Moreover, this sort of planting does not require as great an understanding of what is involved as the planting of turnips or carrots. The potato-grower does not plant a small seed which sprouts and grows into a plant, another part of which is eaten. The potato-grower simply puts back into the ground a piece of the same stuff he eats.

Diffusion may also have been accelerated by other practices. Local exogamy, especially among the upper classes, and residence with the husband's family mean that women have greater mobility than men, and that women's activities have a better chance of spreading than men's.

Potato cultivation in turn may have had some influence on the uses of native plants. A Nuwhaha informant reported that the Nuwhaha had patches on Jarman Prairie where they raised three kinds of native bulbs. Each woman had her own strip, and around the patches were high fences of upright poles tied with cedar-limb rope. If a woman found good bulbs elsewhere, she brought them to her patch; and when she harvested the roots, she broke off the tops, crumpled them up, and put them back into the holes the roots came from. A Nooksack reported similar practices for her people at Goshen.[35]

How late this was I cannot say. These may have been practices transferred from potato cultivation or they may be older. Haeberlin and Gunther also have a tantalizing reference to the possible transplanting of *Sagittaria*.[36]

The kind of cultivation practiced by these peoples naturally had its limitations. Without further development, either through more contact with the Whites or through native inventions, the potato crop probably could not have been increased to any great extent. The amount of arable land available was limited, since most of the area was heavily forested. The fertility of the land used was limited; without manuring, crop-rotation, or any such means of renewing it, the soil would eventually have become poor. Simple farming peoples who do not practice manuring or its equivalent simply move on to richer soil. This means slashing and burning or actual clearing of land. The Coast Salish might have burned, as they sometimes did to let berries grow, but real clearing requires steel axes.

35 Stern (1934, p. 42-43) reports a similar seeding practice for the Lummi. But since Stern's data include items which are not Lummi but from neighboring groups I cannot be positive that this is a separate instance.

36 Haeberlin and Gunther, 1930, p. 21.

Another sort of limitation, imposed this time not by the habitat but by the organization of activities within the society, is the limitation of human time and effort. I suspect that women with digging-sticks could not have got much more land tilled than they did, considering the amount of time and effort required of women in their other activities, such as the gathering of other kinds of food and especially the preservation of fish and game brought in by the men. I doubt if potato production would have risen without better tools to till with or a decided shift in emphasis, or both.

But this is simply speculation. White settlement ended the whole native way of life. The Indian men who were taught to plow and sow on reservations were taking over a new way of life.

Recent workers in this area seem to have ignored cultivation. It it understandable that one might say cultivation is due to White influence, therefore it is not part of the native culture. But then neither are the products of steel blades a part of northern Northwest Coast culture nor horses of Plains culture.

I think we can learn something from Coast Salish potato-raising. A culture's ability to accept an item presented to it by diffusion tells us something about the structure of that culture. The ability of Coast Salish culture to accept the potato shows that food-gathering societies may be set up so that they can take over food-producing without wholesale change. But what has happened here is that the kind of cultivation which resulted looks quite unlike that prevailing at the source of the plants. Coast Salish cultivation took the form of something rather close to the simplest form of agriculture known elsewhere. The age-area principle applied to a series of peoples like the Coast Salish, marginal to advanced agriculture, could make a story quite different from the truth.

But the study of a number of such cases—food-gathering societies that were able to fit food-producing into pre-existing patterns—would tell us something about the origins of agriculture. What kinds of societies can begin cultivation?

APPENDIX 1

Tribe or location	*Date of observation*	*Observer*	*Source*
Duwamish	1855	Gibbs	Gibbs, 1855, p. 432
Snoqualmie	1853	Jones	Alvord, 1857, p. 7
Snohomish	1843	Demers	*Rapport*, 1843, p. 57
Skagit	1840	Blanchet	*Rapport*, 1842, p. 65
	1841	Wilkes	Wilkes, 1845, 4:481
	1855	Gibbs	Gibbs, 1855, p. 433
Samish	1857	Fitzhugh	Fitzhugh, 1858, p. 327

Tribe or location	*Date of observation*	*Observer*	*Source*
Nuwhaha ("Neukwers")	1857	Fitzhugh	Fitzhugh, 1858, p. 329
Semiahmoo	1857	Fitzhugh	Fitzhugh, 1858, p. 328
Point Roberts	1841	Simpson	Simpson, 1847, p. 183
Lower Fraser, etc.	1839	Douglas	*Fort Langley Corresp.*, p. 190
Katsey	1852	Cooper and Blankhorn	Nelson, 1927, p. 19
Port Townsend (Chemakum?)	1841	Wilkes	Wilkes, 1845, 4:303
Klallam			
Port Townsend	1855	Gibbs	Gibbs, 1855, p. 430
Port Discovery	1841	Wilkes	Wilkes, 1845, 4:299
Dungeness	1843	Douglas	Douglas, *Journal*, 1840-41, p. 101
			Bancroft, 1887, p. 93
Makah	1855	Gibbs	Gibbs, 1855, p. 429
	1855	Gibbs	Gibbs, 1877, p. 126
	1868	Swan	Swan, 1868, pp. 2, 11, 23, etc.
Sooke	1849-57?	Grant	Grant, 1857, p. 283
Songish	1842	Douglas	Bancroft, 1887, p. 89
Cowichan	1852	?	Douglas, *Letter*, 1852
	1854	Douglas	Douglas, 1854, p. 246
Nanaimo	1854	Douglas	Douglas, 1854, pp. 246-7
	Outside the Sound and Straits Area[37]		
Haida	1841	Work	Simpson, 1847, p. 232
	1878	Dawson	Dawson, 1880, p. 113B
Lower Thompson	1847	Anderson	Bancroft, 1887, p. 167
Pend d'Oreille	1841	Simpson	Simpson, 1847, pp. 143-4
Copalis	1854	Swan	Swan, 1857, p. 259
Quinault	1854	Swan	Swan, 1857, p. 267
Umpqua	1834	Work	Bancroft, 1884, p. 528

Appendix 2

The following are varieties of potatoes said to have been grown before the introduction of those raised in recent years. The descriptions are poor and confusing. It is even possible (though I doubt it) that the first two do not refer to potatoes at all but to other plants, native or introduced. The informants insisted all were potatoes.

1. According to one of the Samish informants, the first potatoes, which were introduced from "across the [Canadian] line," were small, round, and black with white spots. The informant gave no distinguishing name.

37 For further references to cultivation, especially in Oregon and eastern Washington, see Barry, 1929a.

2. ƛ̓'uɣʷk'ə́kələŋ ("no eyes," from k'ə́ləŋ, "eye"), described by a Semiahmoo as the first potato. They were smooth ("dirt didn't stick"), with thin ("thin as cigarette paper"), light orange skin and white flesh, and the size of prunes. Each hill produced a large cluster. The informant saw his grandmother dig these in her patch near White Rock, B. C., when he was a child. Although he is unsure whether they really had eyes or not and did not see the tops because they were dried up, he is certain that this was a variety of white potato. This potato had been replaced by other varieties by the time the informant, (now in his 80's) was grown. He does not know anything of its origin, but remembers his grandmother saying that the Semiahmoo used to get them from the Snokomish at Blackie Spit, Boundary Bay. The Snokomish were wiped out by an epidemic, possibly that of 1852. They were in direct contact with Fort Langley via the Nicomekl River.

The name "no eyes" must have been given to this variety to distinguish it after the deep-eyed variety was introduced. It may have been merely a shallow-eyed potato, but if it were actually without eyes it could not have been a potato at all.

3. šə́pəɬ skä́us ("ship potato," from šə́p "ship"), described by a Saanich as bluish and as big as one's fist. They were raised by chief ləsčeʻ́m's slaves before White settlement, although the name indicates that they were introduced from a ship.

The Semiahmoo believed that this variety had been introduced by a United States government ship before the Indians had any other contact with the government. He described them as similar to the present "red rose" variety. They came after the "no eyes" variety.

A Lummi knew vaguely of this variety and believed it was long, white, and with deep eyes. This sounds like the Saanich informant's kʷi'tələs (No. 4).

4. kʷi'ƛ'ələs (meaning not known), described by the Semiahmoo informant as a big potato, raised by an uncle on San Juan Island during the informant's childhood.

The Lummi informant described potatoes of this variety as almost round, heavy, with reddish skin, white flesh, deep eyes and therefore hard to peel, slow to cook. They were also called χəmχəmi'kʷən skä́us, "heavy potatoes."

kʷi'tələs (wrongly recorded?), described by the Saanich informant as white, long, with lots of eyes. It was also planted by ləsčeʻ́m's slaves in pre-settlement times. They kept the two varieties separate.

5. χʷəŋχʷəŋəl skä́us ("early potatoes," from χʷə́ŋ, "fast"), described by the Lummi informant as small, crooked (kidney-shaped?) and white, with good dry flesh.

Obviously more information is needed on early varieties of potatoes and native plants with which they may have been confused. It is possible that some early varieties still exist and may be collected: Dr Erna Gunther has told me that the Makah still raise a small white "finger potato," which they have had longer than other varieties.

The presence of several varieties of potatoes here soon after the first White contact would not be surprising. It is possible that different Whites introduced different varieties. It is also possible that new varieties were produced naturally from the variety or varieties introduced. Potatoes are usually grown from tubers, and that is the way the Indians learned to plant them. This involved no genetic change from one crop to the next. But let potatoes seed themselves and something different is bound to show up. The difference can then be preserved simply by planting from

tubers again. The Saanich kept their two varieties separate. This is easy when one plants from tubers, since cross-fertilization is not a problem.

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WESTERN PREHISTORY IN THE LIGHT OF CARBON 14 DATING[1]

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THE WELCOME ADDITION of the C14 dating method to the tools of the archaeologist has made it possible to evaluate the chronological picture of Western prehistory in a more definite frame of reference than hitherto provided by the methods of geology, paleontology, pollen profiles, climatic evidence, etc. Since a more precise method of age determination is now available and results in a series of key sites have been published,[2] it is worthwhile to reëxamine the various claims of age and make what adjustments are necessary in our chronology with their implications for cultural developments and areal relationship. There are still questions in the minds of some concerning the reliability of the C14 method under all conditions, for example the relative validity of the method applied to wet and to dry materials, and until these questions are finally answered, a definitive report is impossible. Since, however, any errors in the method as such would probably be constant in nature, the relative results would not be invalid. Therefore the validation that the C14 method offers for western prehistory provides the stimulus for reëxamination of the structure as it has been built to date.

For purposes of this paper I shall limit the word Western to the area west of the Rocky Mountains, excluding the Sandia Cave site and areas north of the Great Basin. This definition may be open to criticism, but I think it is justifiable, first, on the basis of geography, second, on the material available from C14 studies, and third, the availability of archaeological data. There is but one published date on a Folsom site and that date has to be excluded because the specimen was shown not to have come from association with the original deposit but from a later secondary fill. Consequently this date is of use in connection with the widespread disconformity that exists through much of the Southwest but cannot be used to fix a date for the type Folsom locality. Dr Libby, in a radio address, gave an age of 9900 years for "a site near Lubbock," probably the Plainview site, but it is hardly Folsom. For a part of the Basin-and-Range province and the northern Great Basin we have a series of dates that give us geological stratigraphic series

1 Adapted from a paper read, by invitation, before the American Anthropological Association and the Society for American Archaeology at Berkeley, December 30, 1950. I am particularly indebted to Dr Ernst Antevs who read this paper and made valuable suggestions.

2 Arnold and Libby, 1950, 1951.

and relative age of cultural sequences. Therefore I think our discussion can most profitably be confined to the area indicated above.

Scientific thought—and this includes archaeological—behaves as any other cultural phenomenon, if I may anthropomorphize culture without committing myself to membership in any or either of the schools of the nature of culture. In other words, scientific thought does not conform to a straight line development but is much more of a cyclical curve about a trend line. A hypothesis of real significance is advanced which stimulates work along certain lines, and the thought invariably tends to build up along the lines indicated as fruitful by the hypothesis. Concentration of research in this area, which seems to be paying off in results, tends to bring about the neglect of other promising lines of research on the problem for the time being. Then critical reëxamination of the problem may suggest neglected aspects and research along those lines, and brings about a swing away from the current interest which may have run into dead ends or is not as productive as in its earlier stages. So the curve moves away from the previous line of direction. This has been true in archaeology as in other lines of science. Kidder in his "Speculations on New World History"[3] admirably documents this situation in archaeological thought concerning the antiquity of man in the New World and the time occupied by the New World cultures. The C14 method of dating seems to be another of these techniques which give a sudden swing to the curve. However, our enthusiasm for a new and very promising method must not cause us to relax our insistence upon sound stratigraphic methods and collaboration with our colleagues from the fields of geology, paleontology, and botany, to mention but a few.

The following discussion will consider, first, the general picture of time relationships of the various areas step by step before the release of the C14 dates, then, second, the revisions or confirmations necessitated by the C14 results, and finally some of the problems which the new chronology formulates for us both as to cultural problems at the archaeological level and the C14 method itself.

PRE-CARBON 14 DATES

Cochise. I shall start with the Cochise Culture and move west to the pluvial lake region of California, then to central California, to Gypsum Cave, and north into the northern Great Basin.

Sayles and Antevs describe the Cochise culture as follows:

> The Cochise Culture, comprising three pre-pottery and essentially pre-house stages, namely the Sulphur Spring Stage, the Chiricahua Stage, and the San Pedro Stage,

3 Kidder, 1936, pp. 143-151.

are represented by artifacts in the beds exposed in the arroyo walls of Whitewater Creek in southeastern Arizona. The geological and the climatic history of the deposits being fairly well known, the cultural remains can be dated with reasonable certainty. . . . . The Sulphur Spring Stage would then comprise the age prior to 8000 B.C.; the Chiricahua Stage, the age 8000 to 3000 B.C.; and the San Pedro Stage, the age 3000 to 500 B.C.[4]

It is unnecessary to enter upon a discussion of the methods used in their work except to point out that the authors relied upon evidence from geological, paleontological, and paleo-botanical sources. In discussing the Cochise culture it is necessary to remember that the authors visualize the development as continuous.

One geological factor in the profile, however, has lead various observers to formulate different theories as to the age of the Chiricahua Stage. This is a disconformity which is widespread in the Southwest. At least to the geologist the significance of this factor is important, for it reflects a stage of aridity of unknown duration. Its significance for the Cochise Culture depends on whether the artifacts are associated with the early or late part of the period of erosion or were deposited after the arid period came to an end. Antevs writes:

The artifact bearing beds d and e which consist of dark massive silt and bluish-black clay, respectively, may be pool deposits. Such erosion and deposition took place for a long duration of time, and in places the deposition followed first a long time after the erosion. Therefore, the geological occurrence does not indicate whether the beds d and e and the embedded artifacts derive from an early or from a late part of the dry Middle Postpluvial. However, the fact that the artifacts of the San Pedro Stage, as will be presently shown, occur in the same and but little higher stratigraphic position, suggests that the Chiricahua artifacts derive from the early part of the Middle Postpluvial, are perhaps some 6,000 years old.[5]

Antevs is guarded in his statement of the possible age of the Chiricahua Stage. It should be noted that these comments apply only to the beginning date of the Chiricahua Stage. The Sulphur Springs Stage is not affected.

Hack[6] has studied the geological evidence of climatic changes in the Southwest, and Haury[7] has applied, diagramatically, the dating of Hack along with that of Antevs and Bryan to the Cochise series. Hack[8] places the period of erosion in the Hopi country from 6000 to 4000 years BC. Haury puts the Chiricahua Stage after the termination of Hack's arid period, thus dating it as starting about

4 Sayles and Antevs, 1941, p. 55.
5 *Idem*, p. 52.
6 Hack, 1942.
7 Haury, 1950 p. 528, fig. 114.
8 Hack, 1942, p. 68.

6000 years ago. Whether Hack agrees with this is not known since he does not refer to the Cochise Culture in his monograph.

Bryan, in his contribution to the geology of Ventana Cave, discusses the significance of the disconformity and the relation of the Chiricahua Stage; in the figure referred to above, Haury summarizes Bryan's theories. Bryan would associate the erosion period with the arid Middle Postpluvial very closely and would place the Chiracahua Stage after the erosion cycle. Haury equates the beginning of the Chiracahua Stage in Bryan's system with an antiquity of 4000-4500 years. There is no essential conflict concerning the Sulphur Springs Stage.

Haury sums up the situation concerning the Cochise culture chronology as follows: "The obvious answer is that we still have far to go in bringing the respective ideas of geochronology into agreement."[9]

Antevs' original dating of the Cochise Culture was based on the belief that the Last Pluvial ended 10,000 years ago and that the period 7500-4000 years ago was warmer and drier than modern times.[10] Since the Sulphur Springs sites indicated moist climatic conditions and contained bones of extinct mammals, they were considered to be "more than 10,000 years old." The "datable" Chiricahua sites which occurred on the floors of old arroyos were referred to the middle part of the warm-dry age and dated at about 6000 years ago.

In 1948, however, Antevs revised the climatic chronology.[11] The transition from the last Pluvial to the long dry age was now set at about 7000 years before our time. This automatically changed his antiquity for the Sulphur Spring Stage to about 8000 and more years.

As regard the age of the Chiricahua Stage, the occurrences on the Wet Leggett (eight miles west of Reserve in west-central New Mexico) are instructive. Here the artifacts are found in the upper 1.5 feet of a bouldery gravel and in the lower 11.5 feet of the overlying silt.[12] Since the gravel is a residue of channel erosion, this gravel and contained artifacts really derive from the dry age,[13] while those well up in the silt postdate the dry age. Antevs concluded that these Chiricahua artifacts "range in age from 5000 to 3500 years." The occurrence of Chiricahua implements in the silty arroyo fill implies, Antevs believes, that the arroyo erosion which immediately underlies the San Pedro artifacts at the principal sites in the Sulphur Spring valley represent a later, hitherto unknown, dry age,

9 Haury, 1950, p. 529.
10 Sayles and Antevs, 1941, pp. 42, 55, 56.
11 Antevs, 1948, pp. 176-178.
12 Martin, Rinaldo, and Antevs, 1949, pp. 49, 55.
13 *Idem*, pp. 49, 51, 57.

perhaps about 1000 BC.[14] He therefore placed the boundary between the Chiricahua and the San Pedro Stages at about 1000 BC.

Summarizing the theories for the age of the Cochise culture, we may put it this way: The Sulphur Springs Stage represents human occupation from an uncertain time up to about 8000 years ago. There is difference of opinion whether the Chiricahua Stage follows immediately thereon or is separated from the former by a long period of approximately 3000 or more years.[15] I shall return to this portion of the problem in the section dealing with the C14 dates.

Ventana Cave. Turning our attention to Ventana Cave, recently reported on by Haury in his brilliant monograph, we have further evidence of man in the Southwest during the early part of the Postpluvial or Neothermal period at a time most certainly correlated with some part of Sulphur Springs Stage. The continuity of the cultural sequences—as far as the chronological record goes—is confused here by a disconformity occurring on the upper surface of the volcanic debris. Referring back to Haury's table,[16] wherein he gives a trial correlation of the relative chronologies of Antevs, Hack, and Bryan, we find Antevs and Bryan (as interpreted by Haury) agreeing on 10,000 years as the age of the bed next below the erosional disconformity which terminates the Ventana Complex stage, while Hack's dating gives 8000. The Red Sand is put at 7000 in Antevs' system, 6000 in Hack's, and 4000 plus in Bryan's. This later picture appears confused, although there is substantial agreement on the early record. Antevs, however, informs me that, if the erosion, the red sand, and the talus were associated with dry climate, as Bryan is inclined to believe,[17] then, since 1948, he would date the bed beneath the erosional disconformity at 8000 or more years, the red sand at about 5000 years, and later beds and cultures in agreement with Bryan's alternative B. Haury made use of the dates for the end of the Pluvial put forward by Antevs before the latter's 1948 revision.

One thing can be agreed on, namely, that there is represented in Ventana Cave under the erosion surface a manifestation of culture called by Haury the Ventana Complex. This culture is associated with various extinct animal remains, evidence of a moister climate, and occasional use of the cave by hunting parties. Whether this is contemporaneous with the Sulphur Springs Stage, earlier or later, is not clear. Haury thinks the Ventana Complex, while in the general range of the Early Postpluvial, is slightly earlier than the Sulphur Springs Stage, but

14 See Wormington, 1949, p. 90.
15 See Haury, 1950, p. 126 for Bryan's dates.
16 Haury, 1950, p. 528, fig. 114.
17 *Idem*, pp. 84, 85, 523, 528.

Sayles, who worked on the Cochise materials, is of the opinion that the two manifestations were contemporary. Haury is impelled to his point of view because of the lack of cultural correspondence between the two manifestations. He believes that the concentration on a gathering economy of the Cochise culture represents a later specialization than the hunting complex from Ventana. If Haury is correct, it is unlikely that the difference in time is great. The item in Haury's theory of more importance than the time element, at least to me, is the validity of the implication in this theory for primitive economy, as an all or none proposition.

I should like to offer the following suggestion regarding a possible relation of the Ventana Complex and the Sulphur Springs Stage. The Sulphur Springs Stage, which is almost entirely a representation of a gathering economy, has always seemed to me to be at variance with ordinary food habits of any group with which we are familiar. To be sure all peoples have food preferences but this does not mean full dependence throughout the year in a complete economy either of gathering on the one hand or hunting on the other. What we do have is seasonal use of each of these foods, and the archaeologist would be expected to find evidence of such use if the sites he excavated were seasonal in origin. The fact that we find these and not others still does not prove that the others do not exist. The opposite to the Cochise picture is presented by the Folsom sites. All these sites except the Lindemeier site are definitely those used by hunting parties and many of them are associated with bog hunting. The Lindenmeier site, while it is a camping site of long use, may still be one mainly used by hunting parties while the localities where the housekeeping was done, so to speak, are still to be found. If the time of occupation of sites was during a somewhat colder climate than we have now, then certainly those places where Folsom traits have been found were not localities where one could spend a comfortable winter—this would be true even if the climate were like that at present. The almost pure hunting complex of the Folsom is as difficult to explain as the pure gathering of the Cochise. Both pictures as of the present may be correct, but it is also true that both may be one sided, based upon the selective evidence with which the archaeologist is so often forced to work.

Now Ventana Cave is not far from the area of the Sulphur Springs Stage manifestation and it is clear from Haury's evidence that the ancient Ventanans either traded with California or were in contact by expeditions with the Gulf of California, a minimum of ninety miles. So it can be reasonably assumed that they were pretty mobile. There is one grinding stone from the Ventana Complex, and this is significant, it seems to me, in the light of the limited number of total specimens and the fact that the remains were left in the main by itinerant hunting

parties. Furthermore the evidence throughout the Basin to the north shows clearly the dual dependence upon hunting and gathering. Ventana Cave is a part of the Basin-Range province, not of the High Plains. My suggestion concerning the relationship of the Ventana Complex and the Spulphur Springs Stage is that they are complementary manifestations of the same basic culture, the one representing the remains of widely ranging hunting parties and the other the activities associated with the more sedentary winter campsites. This may be no more correct than the theories of separateness, which I find difficult to accept, but on the other hand it has definite points in its favor.

The succeeding stages of Ventana Cave are difficult to place chronologically primarily because of the erosional disconformity on top of the volcanic debris.[18] Haury ties this stage in with the Chiricahua of the Cochise to the east and the Amargosa II of the west after assigning the Red Sand level materials to a Ventana-Amargosa I manifestation. Haury would date the Chiricahua-Amargosa II phase as beginning about 4000 years ago, if I read him correctly. He is more inclined to accept Bryan's dating than the earlier one of Antevs which he used for this period. Haury finds it difficult to believe, and understandably so, that the culture could have remained static for the long period implicit in the earlier Antevs' chronology but this difficulty is avoided when the revised dating of Antevs is used. I shall show later, however, in connection with the C14 datings that there is plenty of evidence for very long periods of time with very little change in culture.

California Desert. The position of the California Desert region has called forth markedly different theories about the chronology. The publications of the Southwest Museum[19] advanced theories of an occupation of the old pluvial lake basins in the Early Postpluvial. Rogers[20] published on the work he had done in the same and related areas, advancing conclusions strongly in conflict with those of the Southwest Museum workers. He fixed the earliest occupation of the area at about 4000 years ago, giving an antiquity of a little more than 3000 years to his San Dieguito I. The Pinto-Gypsum Complex started about 800 BC or 2800 years ago and continued down to 200 AD: this complex is tentatively correlated with a Basket Maker I. The Pinto-Gypsum runs into Amargosa I and II, and these are tentatively correlated respectively with Basket Maker II and III.[21] Since the sites yielding Gypsum points are more numerous in California

18 *Idem*, p. 528.
19 Campbell and Campbell, 1935; Campbell *et al.*, 1937.
20 Rogers, 1939.
21 *Idem*, pl. 21.

than in Nevada, according to Rogers, he apparently would place the center in the former state and regard the Nevada manifestations as peripheral. This inference is mine based upon the evidence in Rogers' publication. Haury equates Amargosa II with Pinto-Gypsum.[22]

Since at this point we are trying to describe the pre-C14 situation I shall depend on Haury's analysis, for he has enjoyed the coöperation of Rogers in making comparisons of the California materials and the Ventana specimens. Rogers, apparently on the basis of similarity of San Dieguito I and the Ventana Complex artifacts, is now willing to assign an antiquity to his earliest stage that is comparable to that of the Ventana Complex. It should be observed that this tends to support the early theories of the Southwest Museum workers for the Lake Mohave early horizon. The Pinto-Gypsum or Amargosa II is correlated with Chiricahua and assigned by Haury, at least tentatively, to a starting date of about 4000 years ago. There is thus a gap in the sequence covering the Middle Postpluvial or Altithermal at least in Ventana Cave, which lacks San Dieguito II and III. In California perhaps this period is then occupied by San Dieguito II and III although, since this material is from surface sites, a chronology is extremely difficult to estabilsh.

So far we have from eastern Arizona to the ancient lakes of southern California an early culture that has been dated somewhere before 8000 years ago but beyond that it would be unwise to be more precise in trying to establish any initial point. What follows upon this until about 5000 years ago is uncertain. Then the record picks up again and is continuous from then on, but this part of the story does not concern us in this paper.

Central California. In central California the work of Heizer and his associates has resulted in the establishment of three horizons: Early, Middle (formerly called Transitional), and Late. While this sequence is established in the central valley, efforts are being made to correlate it with the coast to the west, and substantial success seems to have been achieved. The geological problems in the central valley area are very complicated: Heizer has been assisted by various specialists in an attempt to work out the age of the various sequences. Working on the chemistry of bones from the burials, Cook has formulated certain possible dates based upon an assumed date for a given horizon. By the use of a method to exclude "possible rapid changes directly following interment," and assuming the age of the "mean for the entire Late period" at 500 years and for the Middle at 2500 years, Cook suggests an age for the Early period of 11,000 years.[23] If the

22 Haury, 1950, p. 538.

23 Cook and Heizer, 1947, p. 213.

age of the Middle is put at 4500 years, then the Early would be 21,500 years ago. Cook is offering these suggestions, not to fix a date of these horizons, but to illustrate a method which may eventually be useful in dating archaeological materials. The importance of his contribution lies in the suggestion of a considerable antiquity for the Early horizon in central California.

Heizer, who collaborated with Cook in these studies, feels that the 11,000 year possibility is probably excessive and writes:

> . . . I have just completed an analysis of the Early Central California culture and arrived at an estimate of its age in the neighborhood of 4000 to 5000 years. I am not saying that my guess is better than Cook's mean, and a number of soil chemists, geomorphologists, and geologists who have seen our Early horizon sites have suggested an antiquity in the neighborhood of 10,000 years. These estimates have always been regarded as intuitive guesses, but perhaps they were hitting closer to the mark than we supposed.[24]

Heizer and Cook in a later paper suggest 2500 BC or 4500 years ago for the Early period, Windmiller focus.[25]

Gypsum Cave. Turning to Nevada, we have Gypsum Cave excavated by Harrington for the Southwest Museum and described in his monograph published in 1933. This cave, an extraordinarily difficult one to excavate, gave a sequence of culture from Paiute, the most recent, through Pueblo, Basketmaker, and a pre-Basketmaker type. The earliest type was associated with bones of now extinct mammals, in particular the sloth, camel, and horse. In addition the cave showed a sequence of deposits stated as follows by Harrington:

> The strata in Gypsum Cave indicate first a very rainy period with abundant running surface water, followed by a time of increasing dryness, terminating in the exceedingly arid conditions we find today. Very important is the fact that the deposits containing the ground sloth, with associated camels, horses, and man, were laid down when dessication was quite well advanced, but before aridity had reached its present state.[26]

While many of the plants found in the cave are found today in that section of Nevada, "the plant assemblage represented in the sloth dung is found today at elevations 3000 or more feet higher than Gypsum Cave."[27]

There was a good bit of reluctance on the part of many people to accept Harrington's findings, not only the suggested age of the culture but even the association of man with the extinct animals. I remember very vividly looking at

24 Cook and Heizer, 1947, pp. 218-219.
25 Heizer and Cook, 1949, p. 88.
26 Harrington, 1933, p. 167.
27 Laudermilk and Munz, 1934, p. 37.

an exhibit of Gypsum Cave materials at California Institute of Technology during the AAAS meetings in 1931 with a distinguished ethnologist who airily disposed of the whole problem by the theory of earthquakes reversing the strata.

Harrington estimated the date at about 8500 BC or 10,500 years ago. Roberts estimates the antiquity of the Gypsum Cave deposits at probably 8500 years ago.[28] Martin, Quimby, and Collier suggest "The Gypsum Cave Culture (Nevada), probably from 5000 to 8000 years old."[29] None of these authors indicate whether their dates are maxima or minima, but it is obvious that the cave was used for a long time by the hunters of the now extinct animals. The shortest age-span, 5000 years, is that of Martin *et al.*, which is considerably less than the next more conservative estimate of Roberts, 8500 years. In view of these dates, attention is called to Roger's dating of the Pinto-Gypsum Complex and apparently Haury's recent acceptance of it.

Lovelock Cave. Lovelock Cave in the Humboldt Sink area of Nevada, lying between the Gypsum Cave region and south central Oregon, unfortunately provides us with nothing definite to add to our pictures because of the nature of the excavation. Loud in 1912 dug the cave as a "collector" for the University of California. Harrington in 1924 attempted to derived stratigraphic data but without too much success. Nothing is now known of the floor of the cave and the occupation—whether the whole cave was occupied as a unit or a part at a time, and if so, in what order. Probably the most significant chronological element of the cave is the absence of any fossil fauna. This would argue against any antiquity in the Great Basin greater than 6000 or 7000 years—and probably considerably less would be more nearly correct.

More elements of the situation in the Humboldt Sink area will be filled in when Heizer and Krieger publish their reports on Humboldt Cave. The Leonard Rock Shelter, to be referred to in my final section, helps clarify the situation.

South-Central Oregon. In this section I shall discuss the material from south-central Oregon in the extreme northern part of the Great Basin. The work in this area has all been done under the direction of the writer. The situation concerning the dating of the various periods of occupation of the region has been difficult to understand. Cressman and his colleagues (Williams, Antevs, Howard, Hansen, Allison, Stock, and Smith) have worked coöperatively on this program since in the early 'thirties. From a geological point of view the best sites were those stratified by pumice from the Mount Mazama eruptions and the later Newberry explosions, in each case the terminal activity of these two volcanoes. The first

28 Roberts, 1940, p. 107.

29 Martin, Quimby, and Collier, 1947, p. 82.

dating in a relatively fixed chronology, as against a floating one, was given by Williams for the Crater Lake pumice as follows: "Tentatively, the evidence points to an age of approximately 5000 years, and to a maximum of 7000 and a minimum of 4000 years."[30] This information applies to the Summer Lake Caves[31] and the Wikiup site on the Deschutes River.[32]

In 1945 Allison published a paper on the chronology of Summer Lake, based upon an unusually long geological profile, in an effort to correlate lake levels with the pluvial history of the Great Basin. His work was directed particularly toward the significance of the pumice beds in the profile. He writes:

> Thus we have three answers concerning the age of the main sheet of Mount Mazama pumice and of Crater Lake: (1) about 14,000 years, based on climatic conditions necessary for the persistence of pluvial lakes; (2) about 13,500 years, based on the rate of sedimentation; (3) 10,000 years based on peat profiles. As the first two nearly agree, whereas rates of peat accumulation differ and generally are less reliable, the estimate of about 14,000 years for Crater Lake is preferred. [Further] We may conclude, therefore, that the evidence from the lacustrine record of the several pumice falls in the Summer Lake basin tends to substantiate the judgment of Cressman (1942, p. 94, 135-140) concerning the antiquity of man in south-central Oregon, founded in part on cultural considerations, that the period of human occupancy of the region began at least 10,000 years ago. Moreover it tends to increase that figure to some 14,000 years ago.[33]

Allison's high figures are based upon Antevs' view at the time that the last Pluvial ended 10,000 years ago.

Hansen,[34] working from pollen profiles in this area as a part of a wider study of post-glacial forest succession in the Pacific Northwest, has also contributed to an understanding of the chronological problems of the northern Great Basin. His studies have confirmed the theories of climatic variation derived from a variety of sources of evidence. Understanding the difficulty of fixing a chronology from a pollen profile without a series of fixed referents, we can use Hansen's dates as contributory to the general solution of the problem. He wrote:

> The records of glaciation on the slopes of Crater Lake mountain and in the rim of the crater, shows that Mount Mazama erupted after the maximum of Pleistocene glaciation. The pollen records reveal that it erupted before the time of maximum warmth and dryness, but not until dessication had reached an advanced degree. The thickness of the sediments overlying Mount Mazama punice, the stratigraphic posi-

30 Williams, 1942, p. 114.
31 Cressman, Williams, and Krieger, 1940; Cressman, 1942.
32 Cressman, 1937.
33 Allison, 1945, pp. 803-804, 805.
34 Hansen, in Cressman, 1942, 1947.

tion of the interbedded pumice in some of the sections, the proportions and types of sediments overlying and underlying the pumice, and the incidence of the warm, dry stage as indicated by the profiles in relation to the stratigraphic position of the pumice, all denote that not more than 10,000 years have passed since climatic eruption of Mount Mazama.[35]

On the basis of subsequent analysis of data, Hansen would place the eruption of Mount Mazama at about 8000-8500 years ago, which would bring it into the end of the Early Postpluvial (Anathermal) when the climate had reached a stage of considerable warmth but not the maximum of the Middle Period. Antevs suggests 8500 to 9000 years ago for the Mount Mazama eruption.[36]

For the northern Great Basin, obviously the element of crucial importance in the dating of the earliest occupation is the date of the Mount Mazama pumice. At a number of sites—Wikiup on the Deschutes River, the Paisley Caves in the Summer Lake basin—occupation occurred long before the eruption. In Paisley Five Mile Point Cave Number 3[37] the human occupation was associated with *equus,* camel, bison, and other animals: at least two of this assemblage are long since extinct. How long it took the debris—all sterile—intervening between the occupation material and the pumice in Cave Number 3 to accumulate we cannot be sure, but the time must have been long. Following the Mount Mazama eruption after an unknown period of time occurred the final stages of the Newberry activity. The pumice record of this cataclysm is observed in geological profiles and those from at least one pollen profile and from the Fort Rock Cave where it separates levels of human occupation. The fact that the final eruptions of Newberry are later than the Mount Mazama eruption is documented by Williams, Allison, and Hansen.[38] Once final dates can be established for these two events then it will be possible to give an almost calendrical accuracy to cultural events in at least one section of the northern Great Basin.

Lower Klamath Lake. Finally one other locality needs brief discussion. Cressman[39] reported on a succession of occupations of Lower Klamath Lake, an area lying across the Oregon-northeastern California line. He stated that there were three periods of occupation: (1) an Early, in which human remains were associated with those of an extinct fauna which terminated about 7000 years ago at the beginning of the Middle Postpluvial or Altithermal, (2) a Middle, dating from the time when the lake began to refill, about 4000 to 4500 years ago, and (3) a

35 Hansen, 1947, p. 118.
36 Antevs, 1948, p. 177.
37 Cressman, 1939, 1941.
38 Williams, 1942; Allison, 1945; Hansen, 1947.
39 Cressman, 1942.

Recent or Late. Only the Middle concerns us here. This was dated by a geological study of the shore line features and correlating this evidence with the accepted chronology of Postpluvial climatic changes. The results thus arrived at were corroborated by Hansen by pollen analysis.[40] Cressman[41] correlated the Middle Horizon of Lower Klamath Lake on the basis of limited cultural similarities with the Early Horizon of central California and Deadman's Cave, Utah, especially with the level producing L-shaped scapula awls and worked human bones.[42]

The evidence produced had shown to the satisfaction of the men connected with the work on Early Man in the northern Great Basin that he was there at some time in the Early Postpluvial, associated with a now extinct fauna. There was occupation also at the beginning of the Late Postpluvial. The occupation of the caves beyond the eastern limit of the pumice blankets has not been dis-

40 Hansen, "A Pollen Study of Peat Profiles from Lower Klamath Lake of Oregon and California" (in Cressman, 1942, pp. 103-112); Hansen, 1947.

41 Cressman, 1942, p. 101.

42 Heizer (1949, p. 35) confused the stratigraphy and chronology of the Lower Klamath Lake sequences and the relation of the different horizons to the Early California horizon, when he wrote as follows:

"COMPARATIVE NOTES: WINDMILLER CULTURE FACIES"

"The few culture traits selected for comparative distributional analysis do, however, offer some indications of relationship. The container made of a human cranium (C. 107) is an outstanding example. The only similar piece from western North America appears to be that from southern Oregon described by Cressman as a 'skullcap which had been cut off and drilled with three holes, seemingly for the insertion of a suspending cord.' A number of long bone 'foreshafts,' sharp at one end and beveled at the other, from the same locality in southern Oregon (Lower Klamath Lake) are similar in most details to our bone implements from C. 142. This type is also interesting, since it occurred at Clovis, New Mexico, in association with Folsom points, and is apparently old in Florida. The period of the Oregon finds is not definitely known, but it has been estimated as the beginning of the early Postpluvial (8000-5500 B.C.).

"The use of human bones for artifacts (fibula dagger, C. 56; whistle of radius, C. 142; skull cup, C. 107) is also noted for the Lower Klamath Lake area, from Level 3 in Deadman Cave, Utah (period estimated as 1500 to 3000 years ago), sporadically in the Southwest, and from Mexico. Specific types do not carry through from one area to another, and it does not seem likely that such a general practice indicates connection between Central California and the regions far removed to the South and North."

Cressman (1940-1942) clearly distinguished three horizons. On page 100 (1942) he wrote, "This horizon (Laird's Bay) produced no bone foreshafts." On p. 101 he correlates the Laird's Bay Horizon (Middle), primarily on the basis of the skull cap, with the Early culture of the Sacramento valley. On p. 102 he correlates the Narrows (Early) Horizon with the Early Postpluvial, and the Laird's Bay (Middle) Horizon "was established at the beginning of the late Postpluvial (2000 B.C.) when the lake was beginning to refill."

It is doubtful if the long bone points from the Early California horizon are the same type of projectile as the Clovis point or those from Oregon. Heizer's drawings do not show the bevelled surface for hafting characteristic of those with which he makes the comparison. Quite possibly the California points were socketed.

cussed here because they must be placed by cross-dating, an extremely hazardous undertaking when we are outside the fields of ceramics and supporting dendrochronology, as I shall show later.

Criticisms of South-Central Oregon Dates. Let us turn our attention now to criticisms of the above picture for the northern Great Basin. The first criticisms of the suggested developmental series and chronology were those of Steward and Roberts in two contributions to *Essays in Historical Anthropology of North America.* Steward[43] recognized the possible antiquity of the bottom level in Roaring Springs Cave since it lacked basketry. Since there was no break geologically between that level and the next, the application of a satisfactory date posed certain problems. For the caves with pumice deposits—the condition which really defined our problem—Steward ignored the geological stratigraphy and derived practically all the culture, except the bed in Roaring Springs Cave lacking basketry, from the Southwest out of Developmental Pueblo, about 1000 AD. Steward also uses the sandals from the Oregon caves as evidence of lateness: "As sandals do not occur in the northern Periphery and are found only in the late Lovelock period, this Oregon culture is fairly recent."[44]

Roberts is more specific in that he directs his attention to the pumice deposits. He wrote:

> Volcanic activity in that area continued into recent times, and it is possible that the evidence may correlate with eruptions placed at approximately 1,000 years ago. This would not be at odds with what the artifacts show.[45]

It is a high compliment to the great respect in which all hold Roberts that apparently his suggestion of the 1000 years has been so widely, if uncritically accepted.

Two other references must be made to bring up to date the record before C14 dating. Martin, Quimby, and Collier published their text in North American archaeology in 1947. They write:

> This desert country [southeastern Oregon] was formerly (about ten thousand years ago) a lake basin. . . . The oldest culture of this region was found in a cave. The only articles thus far reported consist of matting, knives, scrapers, drills—all of stone—and probably the throwing stick. . . . This culture is probably not more than two thousand years old.[46]

These authors offer no evidence on which their chronology is based, an obligation that seems clear since it is so patently in conflict with that suggested by the

43 Steward, 1940, pp. 461-462, 466-467.
44 *Idem*, pp. 466-467.
45 Roberts, 1940, p. 94.
46 Martin, Quimby, and Collier, 1947, p. 228.

workers in the field. Neither is their description of the area accurate nor their paraphrasing of the monograph from which they derive their information.

Kroeber in 1948 published the revised and expanded edition of his *Anthropology*. Presumably this represents the defendable point of view of this distinguished elder statesman in the field up to this time and his opinion therefore should carry weight. He refers to the Oregon materials, accepting the evidence of Paisley Five-Mile Point Cave No. 3 as representative of "genuine antiquity." He then continues:

> Wholly separate are the evidences on another problem, that of the age of artifacts buried under deposits of air-borne pumice dust erupted from two volcanoes in the Cascade Range, one of them the basin of the present scenic Crater Lake. The age of an eruption of unknown date can usually be determined much better from the kind of cultural material that it covered than the reverse can be. In other words, the geologist has only a gross scale for short periods, the anthropologist a much more limited but finer one. Now the well-preserved artifacts under the Oregon pumice differ in detail, but not fundamentally, from those above it and from the implements of the recent Indians of the area—say those of the last thousand years or so. The simplest conclusion would accordingly be that the eruptions occurred something like one or two thousand rather than five or ten thousand years ago. It is evident that the pumice-buried artifacts constitute evidence that cannot really strengthen the case for association of the Paisley obsidian flakes with extinct fauna, because it related to a different problem. The obsidian-camel-horse association stands on its own evidence: its weak point is not its age but the indefiniteness and nondescriptness of the artifacts representing the culture.[47]

Thus Kroeber definitely puts the date of the pumice deposition at one to two thousand years ago.

Summarizing this material, we can say that there were two bodies of opinion regarding the age of the northern Great Basin materials from south-central Oregon: first that of the group which has worked with the problem, which placed the pre-pumice deposits some time in the Early Postpluvial or Anathermal or even as late as 5000 years ago, and others, represented in particular by the writers of the last books mentioned, who would place the date of the Mount Mazama eruption at from one to two thousand years ago. These conflicts in opinions will be pretty well resolved in our next section dealing with the Carbon 14 dating results.

Postpluvial Chronology. Before taking up the C14 dates one other point, methodological in nature, must be mentioned. Most of the dating in the Great Basin, southern Arizona, and the desert region of California has been dependent on the chronology of the Postpluvial for this area. This chronology has been

47 Kroeber, 1948, p. 682.

worked out by Gilbert, Russell, Waring, Van Winkle, Gale, and Antevs, among others. Consequently the dating of archaeological remains, when correlated with evidence of the climatic changes on which the geological chronology is based, will of necessity vary with the accuracy of the referent method. This is well illustrated by the revision of the Postpluvial chronology by Antevs and its effects on archaeological dating. This situation is equally true for Carbon 14 dating.

CARBON 14 DATES

Turning to the C14 dates, what do they show about the relative age of the different horizons in the area under discussion? For purposes of discussion I shall assume the accuracy of the dates and then finally call attention to certain methodological problems which are, in my opinion, still unsolved. We shall take the dates available from the areas in the order in which we have discussed them.

Cochise. The Cochise culture has two charcoal samples from the Sulphur Springs Stage, No. 216 and No. 511 (all numbers are Arnold and Libby's sample numbers) dated at 7756 ± 370 and 6210 ± 450 years, which give an average age of 6983 with an error of ± 410. This may be placed at 7000 years ago. No. 515 from the Chiricahua stage, from the dry climate erosion channel, gives a date of 4006 ± 270. A date, 4508 ± 680,[48] exists for the Chiricahua from Pine Lawn but in a fill in a dry climate erosion channel: this is surprisingly somewhat earlier than the Arizona date, when geologically it should be later. Bat Cave, though not discussed earlier, may be mentioned here for its bearing on the general problem of the date of the arid period in the Southwest. Antevs here estimated the beginning date of the cultural deposits with copious organic matter at about 2000 BC, based upon the theory that the eolian sand and dust without organic matter represents the dry period; but Mangelsdorf and Smith,[49] because of misunderstanding,[50] gave the age as "not later than 2500 B. C." The earliest calculated date for Bat Cave (specimen No. 170) is 2862 ± 250, and by extrapolation for the earliest one foot of deposit, 3000 to 3500 years ago.

The revised date from geological and other evidence for the Sulphur Springs Stage was prior to 8000 years ago. Sample No. 216 from Double Adobe gives a date of 7756 ± 370 for the Sulphur Springs Stage, or only 250 years below the minimum date formerly advanced. It should be remembered that any one C14 date represents a point in time, and depending on the place in the deposit from which the dated specimen came, it may be evenly bracketed by deposit, be near

48 Arnold and Libby, 1951, p. 116: sample No. 556.
49 Mangelsdorf and Smith, 1949, p. 217.
50 Antevs, personal communication.

or at the beginning, or at or near the end. In the first case the date would apply to the middle period, in the second to the beginning of the deposit, and the last to the end of occupation. Single dates may be quite misleading for the total picture.

Since there is little real disagreement about the correlation of the Sulphur Springs Stage with the Ventana Complex—although Haury would place the Sulphur Springs Stage slightly later than the Ventana Complex—I think we may tentatively extend the C14 date of the Sulphur Springs Stage to Ventana and put an average date of 7000 on it. If the correlation with the San Dieguito I is valid, then it should be brought into the same period.

As stated, a charred log (sample No. 556) in clayey arroyo fill on the Wet Leggett, New Mexico, gives a C14 date of 4508 years; and this suggests that the Chiricahua artifacts in the bouldery gravel at a stratigraphic level several feet lower may be older than the 5000 years given them by Antevs. As mentioned, the Chiricahua Stage may have lasted until about 1000 BC. The Chiricahua Stage then can be correlated with Haury's Chiricahua-Amargosa II and Roger's Pinto-Gypsum Complex on the assumption that the cross-identifications are correct. However, a serious difficulty, which we shall point out shortly, arises in connection with the latter, as the date for Gypsum Cave indicates.

Central California. When we turn to the central California area, we have two dates. Sample No. 186, listed as from the California Archaic, was taken from a Marin County shellmound inside San Francisco Bay. The date on this is 720 ± 130, an average of two observations, 633 and 911, a pretty large gap. By Archaic I take it that the Early Horizon is meant. This sample should not be used as a chronological referent in the total picture at the present time. It may be important in its possible bearing on C14 methodology. The stratigraphy of this specimen should be carefully checked for the following reasons. If the stratigraphy and the validity of the cross-identification as previously believed is verified, then important problems arise from it regarding its relationship in time to the central valley cultures and concerning the validity of the C14 method. If the stratigraphy is incorrect and the previous cultural identification also proves to be wrong, then the specimen should be disregarded.

An age given the latest of the Early Horizon sites, SJo-68, is 4052 ± 160 years.[51] This date confirms Heizer's estimate[52] of from 4000 to 5000 years for the Early Horizon and ties in with the Middle Horizon of Lower Klamath Lake

51 Arnold and Libby, 1951, p. 116.
52 Heizer, 1949.

previously correlated by Cressman with the California Early period and dated at about 4000 years ago.[53]

There are two age observations for Gypsum Cave specimens: No. 221 from Room 1 and No. 222 from the small adjacent southwest room. Both of these dates are for sloth dung and give a minimum age for any artifacts or evidence of human occupation under it. Measurements for both specimens are given from the surface, and it is impossible, from the information, to be exactly sure where the specimens come from. I take it that the Room 1 specimen, No. 221, comes from the solid layer of sloth dung. The ascertained age of this is 10,445 ± 340; that of No. 222 is 8527 ± 250. Taking an average for these we get an antiquity of about 9500 years for the sloth dung. Harrington estimated the period of the earliest occupation of Gypsum Cave at 10,500 years ago. The C14 date gives a minimum for this manifestation and strongly confirms Harrington. This markedly conflicts with the date of the Pinto-Gypsum Complex arrived at by cross-dating, and indicates that, since the California manifestation of this culture is later and had a long life and a higher development in the California area than in the place where it first occurs, the diagnostic features of the complex were extremely stable.

Humboldt Sink Area. Carbon 14 estimates of age are available for the Humboldt Sink, both from the Leonard Rock Shelter excavated by Heizer and from Lovelock Cave for specimens also collected by Heizer. There are three specimens from the Leonard Rock shelter: Nos. 281, 298, and 554. I assume from Arnold and Libby's description that the first two are from the same level. No. 281, unburned guano "from a layer containing wooden artifacts" has a date of 8660 ± 300, the average of two runs. No. 298 consists of "atlatl foreshafts" "from layer described in 281"[54] and this has a date of 7038 ± 350. The latter date is the first in our series to put a specific age on any artifact. There is a gap of 1600 years in these two readings from the same level. One may reasonably ask if perhaps the unburnt guano represents an earlier deposition in which the atlatl shafts were later lost by some wandering hunter. Obviously the date to be used, as between the unburned quano and the atlatl shafts, is that for the artifact. The later date of these specimens is contemporaneous with the Sulphur Springs Stage. No. 554 Leonard Rock III is basketry associated with an infant burial: this is dated at 5736 years ago, corresponding to the Altithermal in which Antevs and Heizer originally put it.

The Lovelock Cave specimens were collected by Heizer some thirty years after the last excavations in the cave, if I am correct in assuming that they were col-

53 Cressman, 1940, 1942.

54 Arnold and Libby, 1951, p. 117.

lected especially for C14 dating. There are three specimens: No. 277 listed as "Lovelock I burnt guano from the pre-occupation level" and is dated at 4448 ± 250. No. 278, "unburned guano, pre-occupational level" and called Lovelock II, is dated at 6004 ± 250, an average of two runs. Lovelock III (No. 276) is represented by "vegetal material, earliest occupation level" and is dated at 2482 ± 260, an average of two runs. I find it difficult to interpret these dates. There are two specimens from the pre-occupation level, one burned and the other unburned. The unburned is 1500 years older than the burned. How did the specimens get burned? By human action or fires caused by natural forces? We do not know. The specimens of vegetal matter from the earliest occupation level is 3500 years later than the unburned guano and, in round numbers, 2000 years later than the burned specimen. The vegetal matter is unburned, so apparently there is no evidence of any connection between it and the burned guano. The source of the burning of the guano has an important bearing on the occupation of Lovelock Cave. The original situation in Lovelock Cave certainly makes it extremely difficult to determine at this day pre-occupation and earliest occupation levels, unless we have clear information on the entire cave and are sure that "earliest" and "pre-occupation" for any point are applicable to the entire cave. None of the material is definitely identified as an artifact. Therefore, I hesitate to draw any inferences from this data. Heizer's explanation in discussion at Berkeley that these specimens came from under a huge rock fallen at the entrance of the cave and that thus they can be considered as undisturbed because they were sealed by this rock leaves me unconvinced. Cave excavations show clearly that materials some distance out from walls and at the entrance are of dubious value for stratigraphic purposes, in the first case because of material slipping down along the walls and being carried down by rodents, and in the latter case there is every likelihood of disturbance of deposit by the passage of persons in and out of the cave. Heizer's explanation of the nature of the strata under the rock may be quite correct, but it would be more convincing if there were any other geological stratigraphy in the cave to which it could be compared. The time gap represented in the three levels as discussed above make it difficult to visualize these deposits as a continuum. Yet if the two earliest beds represent pre-occupation and are superimposed, there surely ought to be closer correlation unless the samples were taken from widely spaced parts of the beds.

South-Central Oregon. Three series of dates from Oregon clear up the disputed situation in the northern Great Basin. No. 247, charcoal from a tree killed by the Mount Mazama eruption and entombed in the pumice, gives an average from four runs of 6453 ± 250. While several of my colleagues are inclined to

think this date underestimates the age of the eruption, I am willing to accept it until further methodological tests of C14 dating verify it or correct supposed errors. This gives a minimum date for all sub-pumice materials. No. 428 from Fort Rock Cave, consisting of sandals from some distance under the Newberry pumice, has a date of 9053 ± 350. This is an artifact date. This date does not fix the time of the Newberry eruption but gives a maximum date beyond which the eruption could not be placed so there is no inversion of the order of occurrence of the two eruptions as some have unjustifiably assumed. Of particular interest in connection with this date is the fact that several fragments of fine twined basketry bearing false embroidery decoration were found associated with the tested sandals. The basketry is in all respects like many specimens from the caves to the east lacking pumice stratification. These dates make clear that highly developed techniques both in sandals and basketry in the northern Great Basin were in use 9000 years ago and as far as basketry is concerned continued to historic times in the Plateau, the Northwest Coast among the Tlingit, and in the Aleutians. The third dated specimen gives a terminal date for cave occupation on the west side of Steens Mountain. No. 430 is from near the end of occupation of Catlow Cave No. 1 and has an antiquity of 959 ± 150 years, an average of two runs. This specimen was an artifact, a digging stick which had also been used as a poker. As a terminal date this indicates that the preceding deposits in this cave and Roaring Springs to the north did not derive from the Southwest during Pueblo II times as has been argued. The relationship seems to be to a northern Great Basin development whose closest affinities are represented in the Leonard Rock Shelter and Lovelock Cave.

It is impossible to do anything more than hazard a guess for the antiquity of the material from Paisley 5-Mile Point Cave No. 3 associated with the remains of an extinct fauna, since we have no records of the rate at which sterile cave deposits accumulate. Gypsum Cave does not help us because the specimens are from different points over the cave floor. Their relative positions are not known since the depths were recorded from the surface: we need to know what happened to the surface in each case. Bat Cave gives us some idea, but there we are dealing with habitational debris and apparently with material which accumulated fairly rapidly. Unfortunately we have no exact date for the first foot of deposit in Bat Cave, only an extrapolated one. Since that level lacked sufficient organic material to use for C14 analysis, it is reasonable to infer that it took longer to build up than the other and that the age of the latter is greater than the estimated 700 years. However, taking an average of 500 years for a foot of deposit of organic materials to accumulate, it would not appear unreasonable to presume

1500 or even 2000 years for a foot of sterile dust and small roof fragments weathering from a cave ceiling to accumulate. If we take the latter estimate then for the Paisley No. 3 specimens, an age might be hazarded of 5000 years greater than that for the Mount Mazama eruption, i.e. about 11,500 years ago, since they were two and one-half feet below the Mount Mazama pumice. In view of other dates this does not seem unreasonable. I see no reason to modify the dates previously suggested for the Lower Klamath Lake area.

Summary of Carbon 14 Dates. Summarizing this section, we have the earliest dates by C14 methods in Gypsum Cave and south-central Oregon, with the earliest dated artifact from the last source. These dates are earlier than those for the regions farther to the south in the Cochise-Ventana area. While the dates for the Sulphur Springs Stage, and inferentially the Ventana Complex, are somewhat shortened, they still fall at 6210 and 7756 years ago; the Chiricahua dates of 4006 and 4508 fall within the latest geological estimates. The Chiricahua may not be continuous from the Sulphur Springs Stage but we cannot be certain with the few dates at hand. The California pluvial lake area seems to correlate with the culture to the east at about 8000 years ago and the central California Early Horizon in its late manifestations falls at 4000 years ago. Finally the C14 dates have in part corroborated the dates for the early Arizona cultures, in part supported the Southwest Museum's dates for the pluvial lake cultures, and extended the age of the desert cultures of Rogers, confirmed the 4000 year antiquity for the Early California in the central valley, confirmed Harrington's date for Gypsum Cave, proved man in the Humboldt Sink area 7000 years ago, and substantiated in the main dates for south-central Oregon.

CONCLUSIONS AND OBSERVATIONS

Some conclusions and observations pertinent to the archaeologists and suggestions concerning further steps in the C14 method may now be advanced. The C14 dates show unexpected antiquity and long persistence for certain technologies such as basketry techniques, as previously indicated in connection with the Fort Rock specimens. The same situation is illustrated by the Gypsum Cave-Pinto-Gypsum relation. Obviously the archaeologist has to be extremely careful about cross-dating sites by use of just any kind of materials. Probably too often we have confused cultural similarity or relationship with chronological. It is abundantly clear that the two are vastly different. Furthermore, the archaeologist needs to pay more attention to ecology. The situation in the Great Basin, with the peculiar relation of life zones conditioned by the orographic features of the region, made possible quite a different adaptation to changing climatic conditions

than in another area lacking the basin-and-range topography. Adaptation in the Great Basin did not mean extensive migration to a completely new area but movements within a region in terms of a relatively limited change in elevation of habitat.

We need to be more alert to some of the well-known premises of anthropology in our interpretation of cultural developments and areal relationships with reference to peripheral regions. Conservatism can be expected in an isolated area and therefore long persistence of certain traits. Also an original situation may change as a result of change in climatic conditions, population changes, development of new areas of contact growing out of population changes, diffusion, and invention. The archaeologist must have all these possibilities in mind in interpreting his material for time and area relationships.

A final problem of primary importance to the archaeologist is raised by these new dates, in particular, what have been the routes of migration or settlement in the West? The answer to this problem has been assumed by many, been ignored by others, and critically examined by very few. If, as it now seems possible, we eventually secure a series of accurate dates derived from digs carefully planned to solve well formulated problems, then we should arrive at the answer to this question. I see no other way.

Finally a word about the C14 method and its application to archaeology. Some geologists have been frankly critical of the accuracy of the method when applied to wet material since there is theoretically a chance for interchange to take place between the specimen and the atmosphere after deposition. An antiquity of 11,000 to 12,000 years for the Mankato stage seems to them much too short and that determined for the preceding period even more so. Estimates of the age of the dry cave materials correspond very well with the C14 dates, as Antevs has pointed out,[55] but the C14 records of those which come from wet sources, which are exposed much of the time to wetness, all seem to be too recent. The problem raised here is certainly one to be examined and not to be considered solved until it has been critically checked.

To answer the question of the accuracy of the dating of wet materials an experiment of the following nature is required. Dry material of the same horizon as wet must be secured and the age of each determined. Sufficient runs must be made to correct for chance error. Then as a further check, a determination could be made on a series of wet materials which in position bracket the material dated from the two sources mentioned above. For example, the Mount Mazama explo-

55 Personal communications, and paper before the American Anthropological Association, Berkeley, 1950.

sion has been dated by C14 methods used on a tree killed by the eruption. This wood is, however, in the open and contains some moisture. Dry cave material from under the Mount Mazama pumice and in contact with it will furnish comparable dry material for dating. Then peat can be secured from a bog in which there is a stratum of pumice. Good peat specimens from immediately above and below the pumice could be dated. These dates should correspond with the Mount Mazama test material if the method is equally reliable for wet and dry materials. It seems to me that only by some such carefully conducted test can this question be answered and the full validity of the C14 method established.

The C14 method is no miraculous tool for the archaeologist. Fortunately he is still going to have to depend on sound stratigraphic methods and coöperation with his colleagues from geology, paleontology, botany, climatology, soil chemistry, and cultural anthropology.

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THE MEXICAN KICKAPOO INDIANS

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THE EXISTENCE of Kickapoo Indians living in northern Mexico has been known in a general way to many anthropologists, but the group's reputation for hostility has been such that few people have attempted visiting or studying them. Nevertheless, Mexican anthropologists have been aware of their existence and they have been the subject of a recent small book by Alfonso Fabila.[1] They were also given a chapter in a recent general survey of Mexican Indians.[2] Because of the unusual nature of these people and since virtually no data are available in the literature, a brief note for North American anthropologists on their present status and culture and on the outlook for intensive study seems desirable.[3]

HISTORY

The history of the Kickapoo removal to Mexico is a long and intricate story; only the main details can be reviewed here.[4] From an original seventeenth century location in western Wisconsin the Kickapoo moved southward into northern Illinois during the eighteenth century, forcing southward the resident northern tribes of the Illinois Confederacy (Mascoutin, Miami, Peoria, Michigamea, Cahokia, Kaskaskia, and Tamaroa) with the aid of the Potawatomi, Sauk, and Fox. In Illinois the Kickapoo first settled around the present city of Peoria, but

1 Alfonso Fabila, *La Tribu Kikapoo de Coahuila* (Biblioteca Enciclopedica Popular, no. 50, Secretaria de Educacion Popular, Mexico, 1945).

2 Carlos Basauri, *La Poblacion Indigena de Mexico* (3 vols., Secretaria de Educacion Publica, Mexico, 1940), vol. 3, pp. 645-663.

3 Data secured from the Kickapoo were gathered incidental to a visit to the Seminole Negroes of nearby Nacimiento, Coahuila. This was a research project of the Department of Sociology and Anthropology of the University of Florida aided in part by a grant from the Viking Fund, Inc. The time spent with them was brief, and no formal attempt to secure ethnographic data was made. The visit included part of two days and a night in August, 1949. Two brief subsequent visits to the Kickapoo at Shawnee, Oklahoma (August, 1949 and May, 1950), and notes made on Kickapoo specimens exhibited in Mexico City at the Museo Nacional (June, 1941) have given some comparative data. Other Kickapoo specimens have been seen in the Museum of the American Indian and at the Oklahoma Historical Society.

Field work was facilitated by information and other aid generously given by Mr and Mrs D. S. McKellar, of La Mariposa Ranch, Coahuila and Eagle Pass, Texas; Kenneth Porter, Houston; and Dr Jacobo Chapa L., Muzquiz, Coahuila. Subsequent conversations with Walter Taylor and Donald D. Brand gave a broader perspective. Hollis Holbrook and Laymon Hardy accompanied the writer in the field.

4 Unless otherwise noted these data are derived from Grant Foreman, *The Last Trek of the Indians* (Chicago, 1946) and Fabila, *La Tribu Kikapoo de Coahuila*.

some gradually moved southward and eastward into Indiana along the Wabash, forming two main groups.

Both groups relinquished their lands by treaty in 1819 in return for a tract in southwestern Missouri. Migration to the new land was slow, some groups going, others moving in with the Sauk and farming their land. Moreover, once in Missouri, trouble arose over hunting territories between the local Osage and the new Indians, Kickapoo among them. Gradual pressure from surrounding and trespassing Whites also combined to make this area generally untenable for the Kickapoo, so in 1830 they requested land in Kansas in exchange for the Missouri holdings. This was granted by treaty in 1832 and most of them moved to Kansas.

Apparently not all the Kickapoo moved to the Kansas reservation, for a number are reported in Texas. These were joined in 1837 by several hundred members of the Kansas group. However, shortly thereafter these Kickapoo, along with Shawnee and Delaware Indians, were forced out by the Texans, and in 1839 they came north of the Canadian River, mainly into Creek territory in the present state of Oklahoma. There several bands wandered independently.

Moving through the former Indian Territory, these Kickapoo came into contact with Coacoochee (Wild Cat), the celebrated Seminole war leader, who at that time was greatly dissatisfied with life under United States supervision. Under his leadership a substantial number of Kickapoo and Seminole made their way to Coahuila in 1848.[5] Two years later a delegation from these Indians went to Mexico City endeavoring to obtain a gift of land. Here a treaty was signed granting their request in return for a promise of aid against the Apache and Comanche who raided northern Mexico. After considerable moving around, the group settled near its present location. Early in the United States Civil War, apparently in 1862, the Mexican group was reinforced by other Kickapoo from the Canadian River. Several years later some left Mexico, and eventually a small group reached the Kansas agency in 1870.

The Kickapoo in Coahuila apparently prospered, and not only successfully fought the Apache and Comanche but also raided across the Texas border for horses and cattle. Time and again they were hotly followed by irate Texans and United States troops, but they were safe from pursuit once they crossed the border. However, their safety and settlement was shattered in 1873 when Colonel

5 Fabila (*La Tribu Kikapoo de Coahuila*, p. 25 et seq.) notes several previous contacts between the Kickapoo and Spanish authorities. In 1784, a Kickapoo chief was given a medal in New Orleans by order of the Viceroy of New Spain. Later in 1824 a group went to San Antonio (Texas) in a quest for land.

Ranald S. Mackenzie disregarded international law and followed the Indians deep into Mexico where he killed or captured all the Kickapoo present in their main village. Later in the same year a civilian commission also went to Mexico endeavoring to bring back to the United States the Potawatomi and Kickapoo. Most of the former tribe removed, and some of the latter, leaving 280 Kickapoo in Coahuila. Those Kickapoo who returned to the United States were located in Indian Territory. Other groups from Chihuahua and elsewhere in Mexico returned to the United States in 1874 and 1875. Some communications were held with the Kansas Kickapoo and a few settled in Indian Territory.

In 1883, a permanent reservation of nearly 200,000 acres was established for the Kickapoo where they were then living on the north side of Deep Fork of the Canadian River in Oklahoma. The 420 Indians were apparently well settled and peaceful, although pressure was being put upon them to take more rapid advances towards "civilization." The Kickapoo resisted change and were apparently relatively satisfied, although they spurned suggestions that their land be alloted individually. However, this was finally done in 1895 when 22,529 acres were distributed among the then 283 members of the tribe, the remainder being opened for sale to White settlers.

Subsequently, a few years later, a number moved south to Mexico where they attempted to obtain land near their brethren at Nacimiento.[6] At the same time many sold their allotments or were defrauded of them.[7] Great pressure was exerted by the United States Government for the return of these people: the Mexican Government refused them permission to join the Nacimiento group, although they were allowed to obtain other land if they wished. Some returned to Oklahoma while others apparently moved to Chihuahua. The Nacimiento people were apparently only indirectly affected by these troubles.

Throughout all the time from 1870's to the present, there was constant intercourse between the Oklahoma and Coahuila groups, and people circulated freely from one group to the other. Contacts were also kept with their neighbors, the Seminole, but the latter gradually drifted back to Oklahoma, leaving only their Negro slaves and part-Negro descendants. These now live adjacent to the Kickapoo, occupying the village of Nacimiento.

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6 Kickapoo history for the last years about the turn of the century is taken from the 1908 Senate hearings (*Affairs of the Mexican Kickapoo Indians*, 3 vols., Senate Document 215, Parts 1-3, 60th Congress, 1st Session, Washington, 1908). Although in some error for their earlier history, this account is probably more accurate for the late period when it is carefully utilized.

7 United States Senate hearings on these cases filled three volumes for a total of 2309 pages.

Although the Coahuila Kickapoo appear to be relatively isolated at the present time, in actuality they have extensive contacts with the outside world. No one is reported to own a car or truck, but an enterprising Oklahoma Kickapoo, with the aid of an old worn-out bus, maintains daily bus service to Musquiz (summer, 1949). From here contacts are made via usual transportation facilities to elsewhere in Mexico and north to the border.

Many individuals are quite familiar with parts of the United States, as they often work in migrant labor groups in Texas agricultural enterprises. Others visit their kin in Oklahoma. Every year some Oklahoma people visit the rancheria, usually for hunting, trading, or a social visit which lasts several weeks to a couple of months. At the time of our visit there, one Oklahoma man had been in residence for a considerable time. Apparently Oklahoma conservatives feel more at home here.

These contacts result in considerable trading and exchange of goods. The amount of material obtained from Oklahoma is probably considerable; in exchange local goods are traded. Mexican (Kickapoo) baskets were observed in Oklahoma houses, and one Oklahoma informant brought back numerous smoked tanned buckskins and beaded moccasins. Since he is a silversmith, it was probable that he traded some of his products for these goods.

PRESENT PICTURE

The center of Kickapoo population lies a few miles northwest of Nacimiento or about thirty miles northwest of Musquiz, Coahuila, Mexico, approximately one hundred miles below the international border. From this region, where they own some 7,000 hectares of land at the headwaters of the Rio Sabinas, hunting parties range considerable distances, particularly to the west.[8]

The Kickapoo territory lies in the foothills of a small mountain range, covered with a thick heavy scrub which is predominately mesquite with huisache and other xerophytic legumes. There is apparently a reasonable amount of precipitation in the area, for it has a certain lush appearance in the summer. In any case both irrigated and dry farming appears to be successful in the vicinity.

8 A second group of Kickapoo are reported to live or have lived in the headwaters of the Rio Bavispe southeast of Huachineda, Chihuahua (personal communication, Donald D. Brand). An occasional early reference to a Chihuahua band is found in historical sources (Foreman, *The Last Trek of the Indians*, p. 211) but little is known of their present status. Perhaps those in Chihuahua at the present time (as above, and Helge Ingstad, *Die Letzten Apachen*, Berlin, 1940) are the settlers from Oklahoma who obtained land after the Oklahoma allotment and subsequent frauds in the first decade of this century (see United States Senate, *Affairs of the Mexican Kickapoo Indians*).

The settlement lies on a small, slightly dissected plateau at the base of some hills and directly on the south bank of the Rio Sabinas. This clear, fair sized stream emerges as a limestone spring a short distance away, furnishing abundant water for household purposes and irrigation. In this distinctive ecological region the Kickapoo appear to have made a satisfactory adjustment of a culture which developed in the contrasting Great Lakes region.

A visitor approaching the Kickapoo rancheria in the summer is immediately struck by the picture this settlement makes in contrast to the nearby Mexican towns he has just left. The settled area is one of small fenced plots, each surrounding two or three rectangular mat-covered houses. Although grass and other vegetation cover the soil almost everywhere, bare and carefully swept ground surrounds each house group, with a low ridge of trash and swept-up soil marking the limit of the green encroachment.[9]

It was difficult in the time available to gain an overall view of the community and to determine the number and spread of the houses, but they appear to be numerous.[10] Wire-and-post fences surround the individual house groups, separated each from the other by a distance of fifty to one hundred yards. Roads lead between, and paths cut across, the plots.

The period we spent at the rancheria perhaps did not give us a normal picture of the camp. On our arrival we found preparations were underway for a dance to be held the next day and there was a general air of busyness. Through fortunate contacts we were cordially accepted on arrival and genially questioned as to the purpose of our visit. In front of every house is a porch-like arbor with a pair of beds or pole platforms. These serve as general lounging areas, and there we sat and conversed with the people. Some shyness was expressed, but after a short time children and adults of both sexes became very friendly. The distribution of several watermelons quickly helped to break down restraints.

Although we were pleasantly greeted, receiving lodging and fresh venison, formal ethnographic questioning was not attempted. The language barrier was

9 This yard area surrounded by a trash ridge should be kept in mind by archaeologists in the Great Lakes region. Under favorable conditions it could probably be recognized in excavations.

10 Fabilas' figure of 63 dwellings in the vicinity in 1940 must be close to the present figure (*La Tribu Kikapoo de Coahuila*, p. 34). He also gives a population of 354 Indians (*loc. cit.*). These include two Comanches, but it is quite probable that individuals from other Algonkin groups are included in this total since Skinner noted the presence of Prairie Potawatomi (Alanson Skinner, *The Mascoutens or Prairie Potawatomi Indians*, Bulletin, Public Museum of the City of Milwaukee, vol. 6, no. 1, 1924, p. 12). Although we were present at an important dance the total number of people gathered was less than sixty; the whereabouts of the others was unknown.

a problem, and then too, we were such objects of curiosity that until almost the end of our stay we were surrounded by children and adults.

There seemed little reticence in answering questions, and people were quite willing to part with ethnographic specimens: in fact after a short time people came from far off houses with jewelry and baskets to sell. There was considerable bargaining for everything purchased, to the amusement of all the surrounding onlookers.

Direct questions, when understood, were generally answered with promptness and little hesitance. Permission was freely given to make photographs, except for the dance.

Physically the people are well developed and superficially appeared quite healthy. They carry themselves well, giving an impression of confidence and reserved pride not observed in any other Indian group of the writer's acquaintance. They make an impression on a visitor, because mingled with this pride is a genuine tolerance.

CULTURAL STATUS

In view of the time spent in the field this section is no more than a simple, uneven summary based on observation, reliable reports, and certain data from recent Mexican authorities. The basic subsistence pattern is apparently agriculture with an important quantity of meat derived from hunting and other foods from wild plant sources.

According to Fabila,[11] in 1936 agriculture was limited to corn, beans, and squash grown in small fields near the houses. Following that year, through the encouragement of the Mexican Government, their agriculture was stepped up by the expansion of wheat planting. The acreage of this crop increased almost nine times between 1938 and 1940; apparently much of this was irrigated. During this period corn production decreased. Fruit trees were also planted in increased numbers at this time.

Small garden patches to furnish fresh vegetables are still found around the houses. Squash often springs up in the house yard just beyond the swept area and is then carefully tended. Peaches, the most important fruit, were a common sight spread out on canvas to dry for storage.

Hunting is now somewhat restricted due to Mexican pressure for game law observance, but deer are commonly taken, several being killed the day we arrived. Hunts may be extended affairs with the men traveling many miles. Deer drives were carried on by groups of men.

11 Fabila, *La Tribu Kikapoo de Coahuila*, p. 13.

Stock raising, increasing in importance, seems to appeal to the younger men. Riding and pack horses were in evidence everywhere.

In addition to utilizing wild plants for food, fire wood, and various manufactures, the sale of some is an important industry. Fabila[12] notes that two hundred tons of walnuts were gathered for the Mexican market in one season. One informant who accompanied us when we left the rancheria took with him several

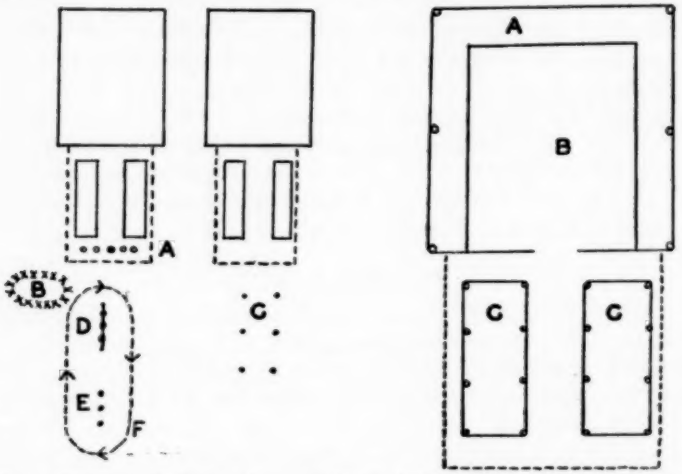
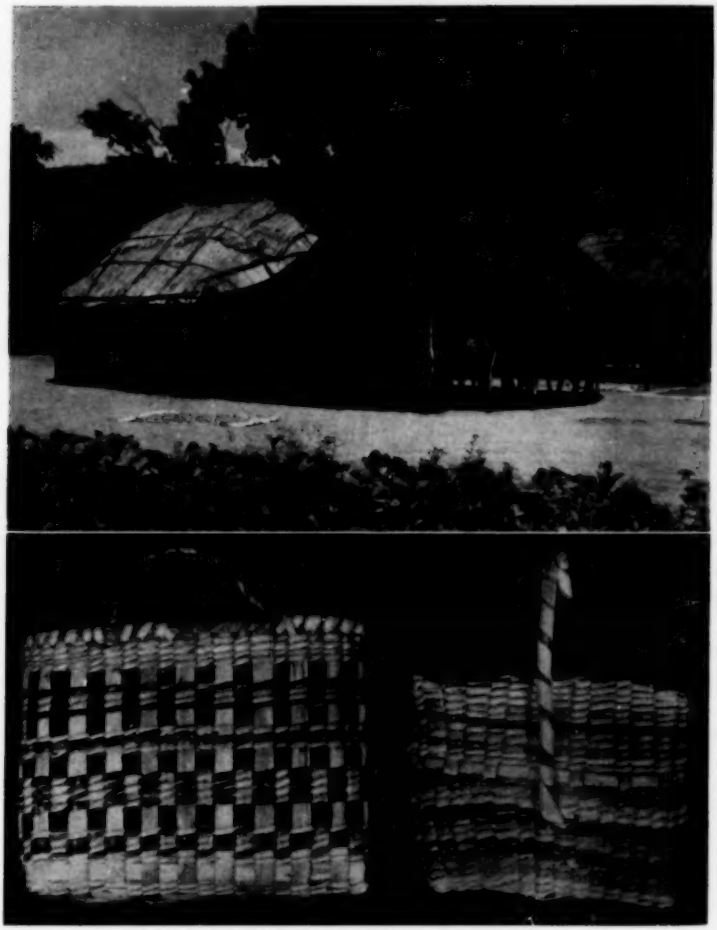


FIG. 1. Diagrams of dance and summer house. *Left:* Dance: A, chanters, drummer in middle; B, chorus; C, shelter for dancers to rest under; D, three brass kettles; E, "shrine"; F, path of dancers. *Right:* Summer house: A, interior platform; B, fireplace; C, beds under "porch."

hundred pounds, respectively, of *chile piquin* and *oregano* for sale in nearby Mexican towns. The gathering of these spices is apparently a not uncommon occupation.

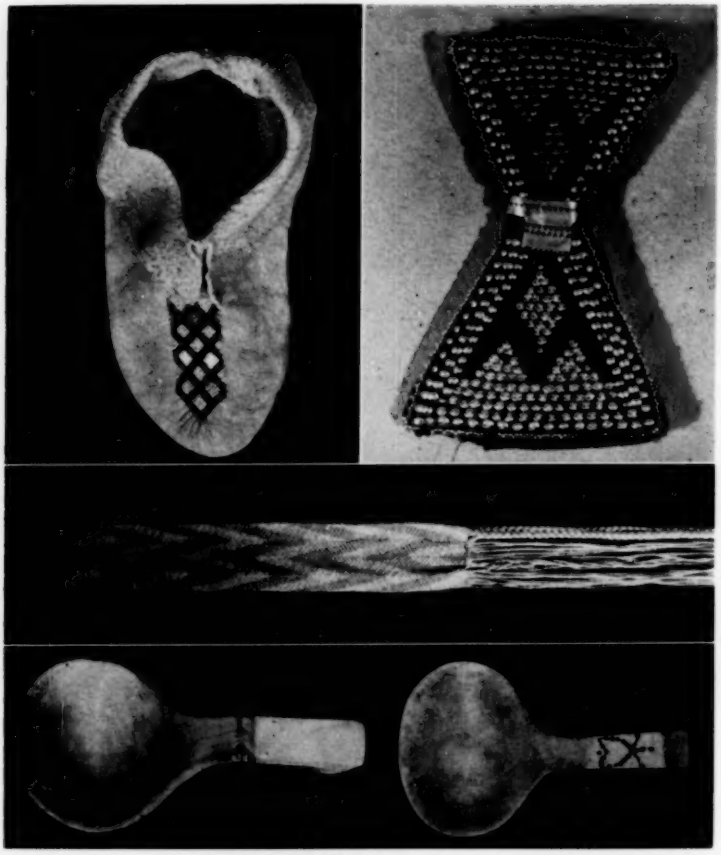
Houses seen are rectangular structures with a timber framework, a mat roof, and an arbor in front. An average measurement is approximately twelve by eighteen feet. The sides are formed of small upright poles secured by a few cross poles. The peaked roof is covered with coarse cattail mats held in place by a ridge pole and a grid of other poles. On the inside, around the whole wall, excepting the door, a platform or bed encircles the room at a height of about three feet. This is used for sleeping, lounging, and sitting. A fire on the ground

12 *Idem*, p. 12.



MEXICAN KICKAPOO HOUSE AND BASKETS

Above: Summer house with swept yard; peaches drying on canvas in sun. *Below:* left: basket (15 inches wide); right: covered basket (7½ inches wide).



MEXICAN KICKAPOO SPECIMENS

Above: Moccasin (10 inches long) and hair ornament (8 inches long). *Center:* Finger-woven sash (3 inches wide). *Below:* Wooden spoons (collected in Oklahoma: left, 8 inches; right, 6½ inches).

in the center warms the house. Furnishings include woven mats, American commercial blankets, and American type trunks, all of which are piled on the platform.

A door is the only aperture in the house. This faces eastward, opening onto an arbor-like porch, almost equally as large as the house. This shelter may be variously covered with a thatch of leaves or grass tied on with strips of yucca. All the sides are open. On each side of a middle passageway leading to the house door are two platforms about three feet high, four feet wide, and eight feet long. The eight forked posts provided for each one supports a rough platform made of cane, sotol stems, other similar stalks, or sawed planks. Like the interior bench, these serve as work and lounging areas. Very commonly two of these houses, with a cook house, make up a dwelling unit.

The adjacent cook house is of similar construction, but smaller, and has a fire in the center and a table platform for working space across the far end. Utensils observed were all modern commercial metal vessels. Outside of the cook house, there is often found an upright hollow log mortar, with a double-ended pole pestle, which still serves to crush corn.

The winter house (not seen) is said to be a domed hut, completely covered with mats. A Mexican Kickapoo winter house is illustrated by Fabila[13] and an Oklahoma example by Skinner.[14]

Present clothing is a mixture of purely aboriginal, early American styles, and modern garments. A few old men approximate former aboriginal style, wearing breechclouts, high fringed buckskin leggings, beaded buckskin moccasins, and a cotton shirt. Most of the men, though, wore modern work clothes—blue jeans and cotton shirt.

Women, however, commonly wear a dress of a type apparently derived from styles of American pioneer times, probably the early nineteenth century. It consists of one or more skirts reaching below the knees, an outside blouse, and an under blouse which is tucked into the skirt. The outer blouse hangs loose and often fails to meet the skirt. One old-style blouse with a well defined yoke covered with numerous small metal brooches was shown us but was not being worn.[15] Dress material is all commercial cotton, both plain and print fabrics.

Similar moccasins are worn by both the women and men. They are made of

13 *Idem*, p. 19.

14 Alanson Skinner, *The Mascoutens or Prairie Potawatomi Indians: Part II, Notes on the Material Culture* (Bulletin, Public Museum of the City of Milwaukee, vol. 6, no. 2, 1926), plate 9, fig. 2.

15 A woman's dress in the Museo Nacional de Mexico has bead embroidered shoulders and front.

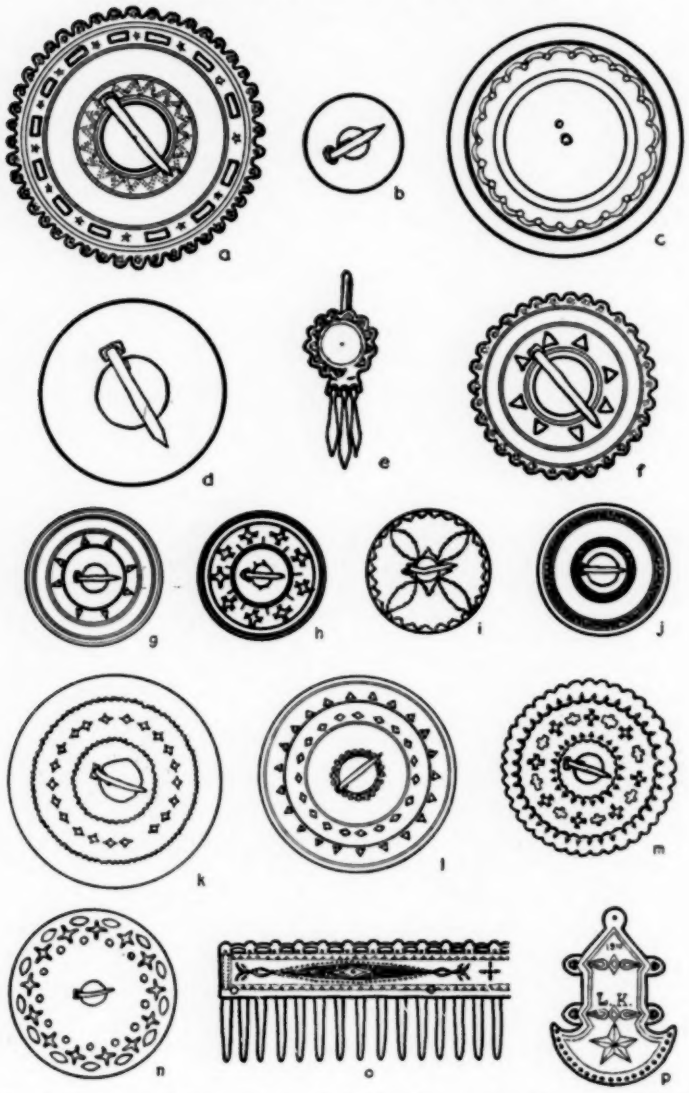


FIG. 2. Ornaments of German silver: a-d, f-n, brooches; e, ear pendant; o, section ($^1/_8$) of comb; p, neckerchief slide (a-f, approx. natural size; g-p, × 0.4).

smoked buckskin sewn with cotton thread, and are the type previously described for the Kickapoo, as being "one piece, with straight heel seam and toe seam."[16] Some are decorated with a beaded strip covering the seam on top of the foot. No decorated ankle flaps were seen.

Hair styles were distinctive. Women wear theirs long and brought together in a single short braid in back. Young girls may make two braids, bringing them around to the front over the forehead. Many of the men wear their hair in usual Mexican style, but others have it bobbed with bangs over the forehead. In the center of the scalp the hair is left to grow long and is plaited, forming a pendant braid hanging down the back.

Jewelry is not common except for a few plain silver rings and stamped German silver bracelets worn by the women, and some large brooches seen on men's scarves during the dance.[17] However, on learning of our interest in old native objects, many things were brought out which were once popular but not commonly worn now. Most numerous was the German silver bar-brooch (*takahona*). These ranged in size from small plain ones 1.2 cm in diameter to pierced, stamped, and engraved specimens as large as 8.1 cm in diameter. Other jewelry included elaborately decorated metal combs, metal neckerchief slides, and several hourglass-shaped woman's hair ornaments. The last are made of black cloth ornamented with small German silver spangles. Remnants of ribbons on them indicate that once, like the Delaware and other specimens, they had long trailing ribbon streamers. A finger-woven (W-design) and a plain knitted wool sash were the only other old style articles of clothing seen.

Mats used to cover the beds are plaited work very similar to Mexican *petates* and unlike the Central Algonkin type mat still made by the Oklahoma Kickapoo. Baskets are commonly used and apparently made for trade to the nearby Mexican population. They are rectangular, elongated and narrow, and quite deep. They have loop handles, and may be with or without covers.[18] They are woven from cattail stems in a twined technique and have simple designs in bright commercial dyes.[19]

Another article of native handicraft seen was a carved, large bowl, short-handled, wooden spoon. This was apparently an old specimen. Similar spoons

16 Gudmund Hatt, *Moccasins and their Relation to Arctic Footwear* (Memoirs, American Anthropological Association, vol. 3, no. 3, 1916), pp. 153-155.

17 Mrs D. S. McKellar reports that silver was more typical in older times as a jewelry metal. Both silver and German silver are represented in the Museo Nacional collection.

18 Baskets of this type are not made in Oklahoma, although specimens obtained from Mexico are not uncommon.

19 Similar baskets in the Museo Nacional may have been dyed with vegetable colors.

are still occasionally made in Oklahoma. A recently made bow and arrow were examined, but these are not commonly used at present (McKellar Collection). The bow is short, of the "self" type.[20] Most interesting was the bow case and attached quiver, which were made of twined basketry similar to the common baskets. No ribbon appliqué blankets were seen, but examples in the Museo Nacional indicate their use here.

The non-material side of Kickapoo culture was not easy to determine on a short visit of this nature, but from the few brief insights obtained of this area of culture there is every reason to believe that it is still rich and complex. Algonkian is spoken by everyone as the primary language. Many of the people speak a greater or less amount of Spanish, but only a few speak English.

A functioning political system seems still to exist, headed by an hereditary chief[21] assisted by a council of elders. They are aided by a police group, who, among other things, patrol the fields and town at night. Our host held such a job during our stay. This may be retained from days when a war organization was active.

The religious aspect of Kickapoo culture is still strong, according to Fabila.[22] A dance was performed during our stay but no data were obtained concerning its nature. It began, after preliminary preparations, early in the afternoon, and was held in a large yard in front of two houses.

In front of one house just inside of the arbor several older men sat on each side of a drummer facing out over the open area. Extending away from them in a row were three large, old style, brass kettles suspended over a fire. From time to time these were stirred with a large wooden spoon which hung on the pole from which the kettles were suspended.[23] Beyond these in line were three short poles or stakes upright in the ground, and over them hung lengths of new cotton cloth and other wrapped offerings. This had the appearance of a shrine.

Eight young-to-old women danced around the fire and "shrine" in a clockwise movement. Their step was basically a shuffle, with little body movement. They were accompanied by the drum and a chorus of singers. After each period of

20 A bow in the Museo Nacional de Mexico has carved ornamental projections on each side of the center.

21 Fabila, *La Tribu Kikapoo de Coahuila*, p. 69.

22 *Idem.*

23 The contents were apparently a venison stew prepared with the deer killed for this purpose the day before. It is not known if it contained dog meat as do most Kickapoo ceremonial dishes (personal communication, D. S. McKellar). The use of dog meat is a good Central Algonkian custom.

dancing the women would rest on the ground under a cloth shade especially raised for them. During this intermission the men flanking the drum chanted prayers.

A number of non-participants watched the dance, behaving with considerable decorum. Dance periods lasted for about fifteen minutes with intermissions of greater length. Unfortunately it necessary to leave before the end of the dance so the termination and feast was not observed.

KICKAPOO RESEARCH

No full research program has apparently ever been carried out among the Kickapoo either in Mexico or Oklahoma. Yet, many people who worked with other Central Algonkins had some contact with these people. For example, the most detailed work with the Oklahoma group was apparently done by William Jones but only a short ethnographic note and a posthumous collection of Kickapoo tales have appeared, while some comparative references are to be found in a paper on the Fox.[24]

About the same general period, in February, 1910, the Coahuila group was visited by M. R. Harrington. He reports[25] that no ethnographic studies were made since the trip was a brief one made to collect museum specimens. A return trip was planned for more intensive work, but was never realized. Subsequently two brief notes were published.[26]

Alanson Skinner prepared monographs on many of the Kickapoo's neighbors. In the course of his field work he must have had extensive contact with the Oklahoma Kickapoo for comparative references to their culture are scattered throughout many of his works.[27]

One of the most recent workers with the Kickapoo and related Algonkins was

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24 William Jones, *Kickapoo Ethnological Notes* (American Anthropologist, vol. 15, pp. 332-335, 1913); *Kickapoo Tales* (Publications, American Ethnological Society, vol. 9, 1915); *Ethnography of the Fox Indians* (Margaret Welpley Fisher, ed., Bulletin, Bureau of American Ethnology, no. 125, 1939).

25 Communication, February 7, 1951.

26 Mark R. Harrington, *New Home of the Kickapoo Indians* (Philadelphia North American, September 22, 1912); *Too Much Hominy* (The Masterkey, vol. 18, p. 155, 1944).

27 In addition to the two items cited in footnotes 9 and 13, there are the following, all published in the Bulletin, Public Museum of the City of Milwaukee: *Observations on the Ethnology of the Sauk Indians* (vol. 5, no. 1, 1923); *idem: Part II, War Customs* (vol. 5, no. 2, 1925); *idem: Part III, Notes on Material Culture* (vol. 5, no. 3, 1925); *Ethnology of the Ioway Indians* (vol. 5, no. 4, 1926); *The Mascoutens or Prairie Potawatomi Indians: Part III, Mythology and Folklore* (vol. 6, no. 3, 1927).

the late Truman Michelson. Early work in Oklahoma resulted in a short paper,[28] but later field work in 1929 and 1930 is reported only in brief general statements.[29] On these trips he met, and perhaps worked with, Mexican Kickapoo. He uses pictures of them to illustrate his reports.

At the present time the Oklahoma Kickapoo are being studied by students from the University of Oklahoma. This program will continue until completed.[30]

No other American anthropologist is reported to have worked with the Mexican group. However, Kenneth Porter, an historian, has had some contact with them while studying the adjacent Seminole-Negroes of Nacimiento. In addition, while working with the same group Ethel Cutler Freeman also had contact with the Kickapoo. Walter Taylor, in progress of archaeological work, met some Kickapoo away from their camps. However, no accounts of Kickapoo culture have resulted from these contacts.

The net result to date, then, is very few attempts to study Kickapoo culture and very little result from work that has been done. They are the least known of any important remaining group of the Central Algonkins.

SUMMARY AND CONCLUSIONS

With the amount of information available certain limited conclusions can be drawn. These will be incorporated in a brief summary.

A group of Kickapoo Indians have successfully existed in northern Mexico retaining significant amounts of their aboriginal culture. The subsistence complex, although apparently evolving in the direction of cash agriculture and migrant farm labor, is still close to the aboriginal pattern. This seems to be true of both agriculture and hunting. Material culture has, in many respects, changed only to a limited extent: housing, dress (in some cases), and other traits are not far from what they were one hundred years ago and even more distant in the past.

Data for social organization are not available, but it is inferred that this is not greatly changed, and the same is apparently true of political organization. War organization, kept intact through many years of Apache and Comanche

28 Truman Michelson, *The Punishment of Impudent Children among the Kickapoo* (American Anthropologist, vol. 25, pp. 281-283, 1923).

29 Truman Michelson, *Studies of the Algonquian Tribes of Iowa and Oklahoma* (Smithsonian Institution, Exploration and Field Work for 1929, pp. 207-212, 1930); *Studies of the Cheyenne, Kickapoo and Fox* (same series, [Report] for 1930, pp. 207-210, 1931); *Anthropological Studies in Oklahoma and Iowa* (same series, [Report] for 1932, pp. 89-92, 1933).

30 Communication, March 12, 1951, from Robert E. Bell.

warfare, may be still functioning in part as a mechanism against the local majority group, the Mexicans.

Throughout the hundred years these people have been in Mexico they have been subject to many influences but none seem to have caused significant changes. That of Mexican culture seems least important. Some minor changes in material culture may be due to this influence (the shift from twined to plaited matting is perhaps an example). However, there may be many more aspects of this acculturation not readily apparent.

Acculturation from other Indian tribes is probably more important but less easy to recognize. The side by side association of the Kickapoo with the Seminole and later Seminole-Negroes certainly may have led to the assimilation of some ideas. Then too, mutual visits with the Oklahoma Kickapoo exposed the Mexican group to many influences.[31]

All of these factors, isolation and Mexican and Indian culture contacts, have made these people an ideal group for detailed anthropological study. It is not improbable that they retain more basic aboriginal culture elements than any other Central Algonkin tribe studied by anthropologists. Moreover, problems of culture resistance, change, and contact can ideally be examined here.

This group can be recommended, then, for future intensive study. It is probable that a serious student with the proper approach can easily gain the good will of the people and conduct detailed work effectively.

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31 For example my Oklahoma Kickapoo informant visits the Mexican groups for several weeks at a time. In Oklahoma he is a silversmith who attends major Indian gatherings, such as the fair at Anadarko, for purposes of trade. Some of his silver work (German silver) is definitely of Kiowa pattern created for that market. Because of these factors this man alone is in a position to receive and transmit much in the way of material culture or ideas to others, among them his Mexican friends.

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